

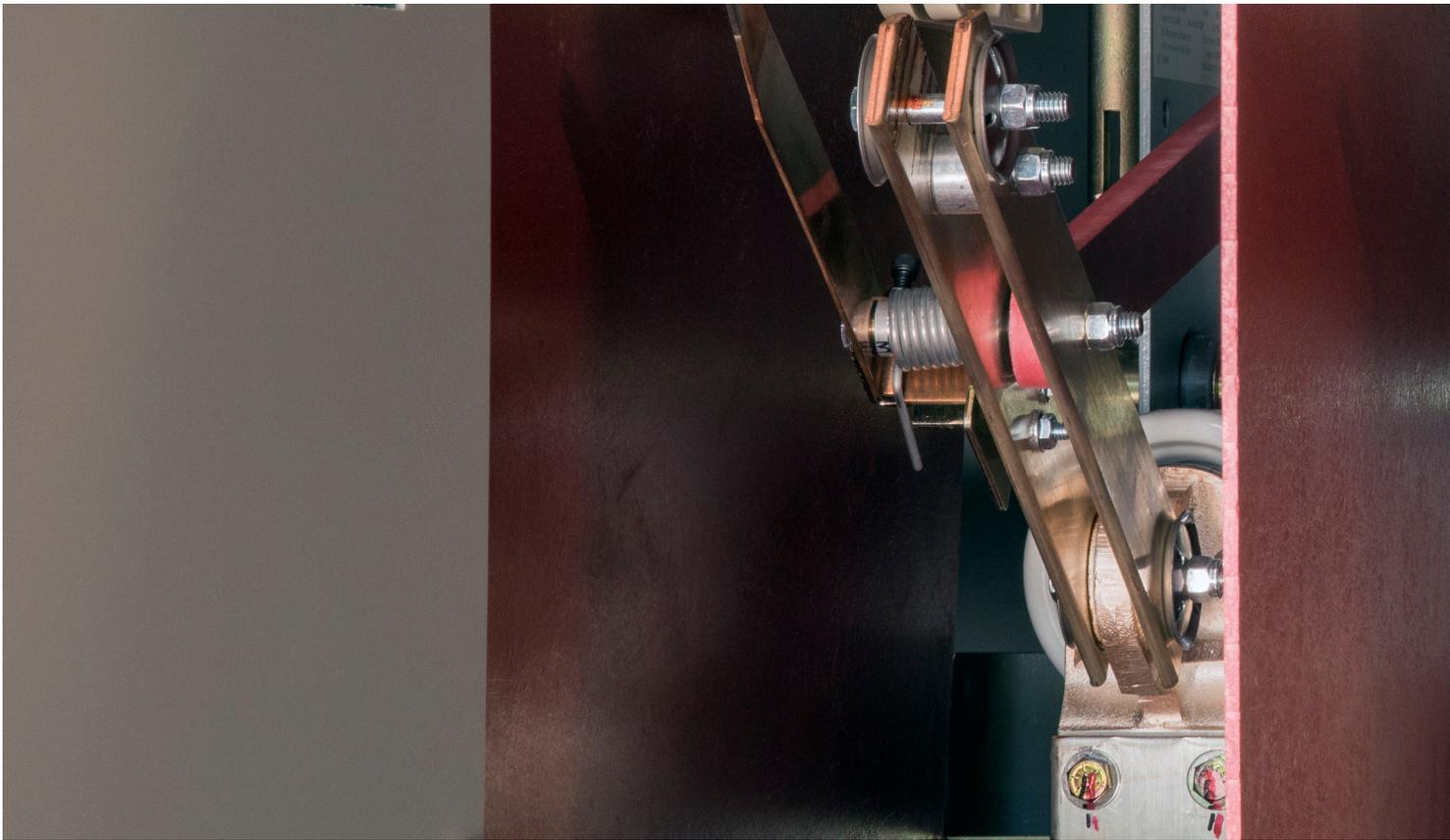


EMMS-T40049-06-4AUS

# SIEBREAK

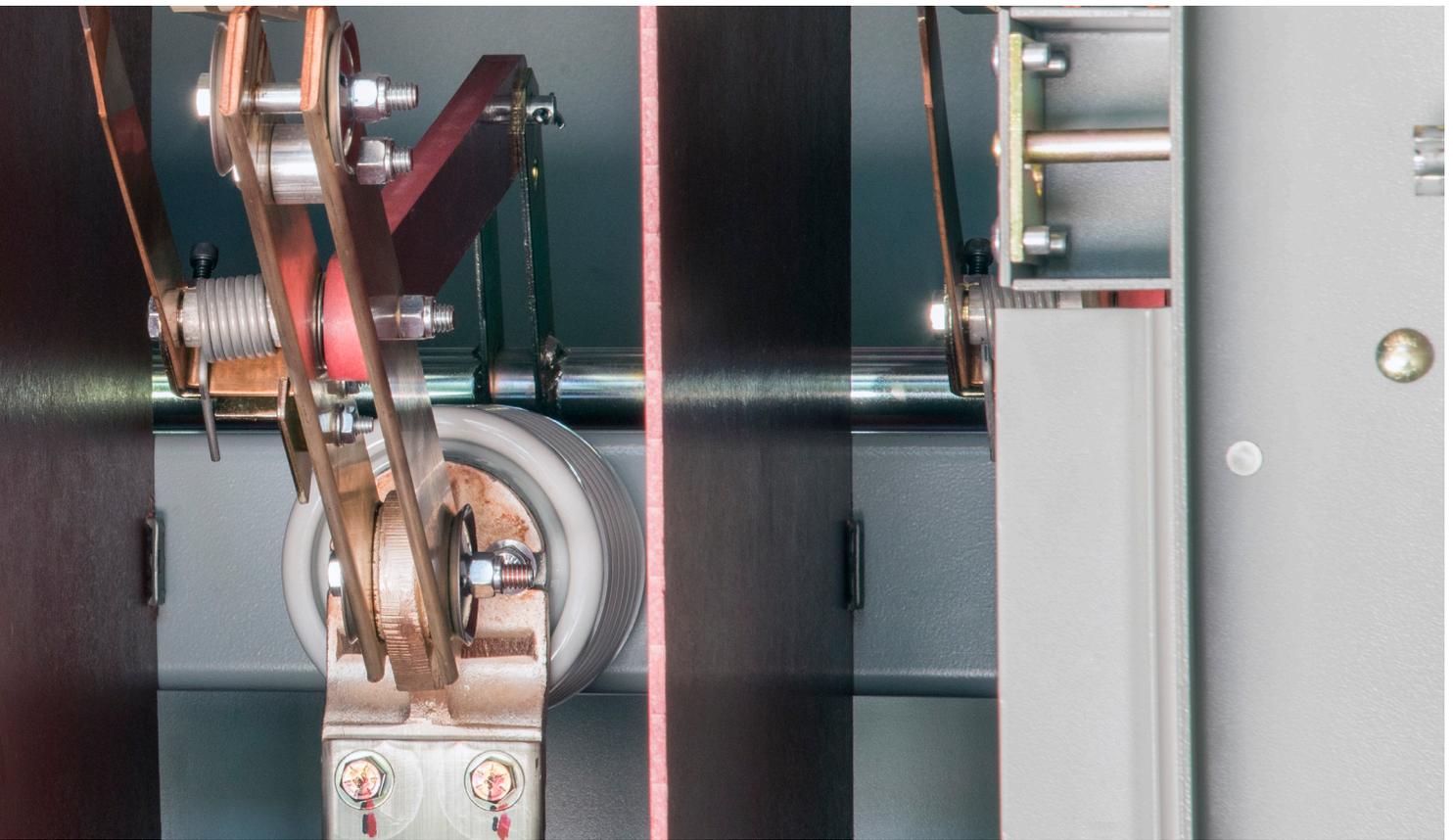
Medium-voltage, metal-enclosed interrupter switchgear  
Selection and application guide

**SIEMENS**



## Use this selection and application guide for:

1. Applications with maximum rated voltage up to 15 kV and continuous current rating up to 1,200 A.
2. Specifying fused and non-fused metal-enclosed interrupter switchgear configurations.
3. Specifying single, duplex, and selector switch types.
4. Assisting with configuring switch type for various applications, including standalone, transformer primary, and lineups.
5. Selecting proper fuse for specific system and transformer rating.
6. Space-saving, front-access configurations when footprint is a concern.
7. Metering capabilities for your switch.



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# Overview



## General

Siemens SIEBREAK metal-enclosed interrupter switchgear is a modular design consisting of a switch, fuses, and bus in an assembly that is fully integrated both mechanically and electrically to provide medium-voltage circuit protection.

Siemens SIEBREAK-VCB™ load-interrupter switchgear is a modular assembly of switches, fixed-mounted vacuum circuit breakers, and bus assemblies that are fully integrated both mechanically and electrically to provide the highest level of medium-voltage circuit protection. For more information on SIEBREAK-VCB, refer to EMMS-T40091-XX-4AUS.

SIEBREAK switchgear is available in both fused and unfused configurations. Supplied in the unfused configuration, short-circuit protection is not available – only load-current interruption is. Supplied fused or unfused, a load-interrupter switch is different than a vacuum circuit breaker in that it will interrupt load current, but not overload or fault currents.

Fused switches are available with current-limiting or expulsion (power) fuses. Fuses extend the range of applications to the maximum short-circuit rating of the fuses, to as much as 50 kA for current-limiting fuses.

A complete product line for various power distribution applications is offered:

- Standalone bay
- Transformer primary
- Lineups, e.g., main-tie-main, main-feeders.

A complete line of switch types is available:

- Single switch
- Duplex switch
- Selector switch.

## Features and benefits:

- 5 kV and 15 kV rated-voltage classes
- 600 A and 1,200 A continuous current
- Non-fused or fused with current-limiting or expulsion (power) fuses
- Indoor type 1 enclosure
- Single, duplex, and selector switch types
- Large 8" x 18" (203 mm x 457 mm) viewing window
- Hinged, grounded metal barrier in front of switch blades
- 11-gauge doors, covers, and barriers
- Silver-plated copper bus bars
- Full-length ground bus
- ANSI-61 (grey) paint
- Phase barriers between switch poles and between fuses
- Provisions for key interlock
- Mechanical door and switch interlock
- Ventilation louvers in top and bottom, front and rear
- Glass-polyester bus supports
- Non-corrosive nameplate
- Switch padlock provisions
- Standard configurations with automatic-transfer control systems
- Space heater (half-voltage) with thermostat
- NEMA hole patterns for cable termination.

## Standard outdoor features:

- Bottom cable-entry cover plate
- Removable filters
- 6" (152 mm) formed steel base.

**Optional:**

- UL and C-UL listing
- Indoor type 2 drip-proof enclosure
- Indoor type 12 dust-resistant enclosure
- Outdoor, non-walk-in type 3R enclosure
- Tin-plated copper bus bars
- Motor-operated mechanism
- High-track resistance bus support
- Auxiliary switches (2 NO-2 NC)
- Mimic bus
- Ground studs
- Screens and filters (indoor)
- Special paint color
- Channel sills.

**Modular configurations:**

- Surge arresters
- Instrument transformers:  
current transformers (CTs) and  
voltage transformers (VTs)
- Control power transformer (CPT)
- Power meter
- Other auxiliary equipment.

**Standards**

SIEBREAK metal-enclosed interrupter switchgear meets or exceeds the requirements of the following standards:

- ANSI/IEEE C37.20.3
- ANSI/IEEE C37.20.4
- ANSI C37.57
- ANSI C37.58
- CSA 22.2 No. 31 (for Canada)
- CSA 22.2 No. 58 (for Canada)
- CSA 22.2 No. 193 (for Canada).

SIEBREAK switchgear assemblies are listed with Underwriters Laboratories and, for use in Canada, have the C-UL listing certifying compliance with Canadian standards and codes.



Type SIEBREAK metal-enclosed interrupter switchgear

# Construction

Type SIEBREAK metal-enclosed interrupter switchgear with front door removed



SIEBREAK metal-enclosed interrupter switchgear is of metal-enclosed construction as described in ANSI/IEEE standards. The equipment is tested and factory assembled in convenient shipping groups. It is ruggedly constructed of 11-gauge sheet steel including the doors. The assembly employs bolted construction.

SIEBREAK's modular design is available in many different enclosure types and bus configurations. The switch mechanism is arranged in the upper portion of the enclosure while the fuses are located in the lower portion for ease of operation and inspection. A large viewing window is standard for viewing the position of the switch blades while the door is closed. The front door and switch operating mechanism are interlocked to prohibit access to the switch compartment or fuses when the switch is closed and prohibit operating the switch-operating mechanism when the door is open.

## Load-interrupter switch Manually-operated, single-throw, gang-operated, stored-energy operated switch

It combines the blades with arc chute to ensure no arcing occurs on main contacts extending the life of the main blades.

A single upward movement of the operating handle charges the operator and closes the switch, and conversely opens the switch by a downward movement of the handle.

## Operating switch handle

Equipped with position indicators to show the position of switch as open or closed. Operating spring is discharged in either position.

## Viewing window

A large 8" x 18" (203 mm x 457 mm) high-impact viewing window is located and gasketed on the front door for direct line-of-sight viewing of the three switch blades with the door closed.

## Nameplate

Non-corrosive rating nameplate.

## Full-height front door

The front door is equipped with two latching, chrome-plated handles. Handles are available in keyed type to add security. The door is equipped with door stop.

## Door and switch interlock

Door and switch interlock prevents access to fuses and switch when the switch is closed and operation of switch handle when the door is open.

## Provision for key interlocks

Operating mechanism is equipped with provision for key interlocking with remote devices, such as transformer secondary circuit breakers or other switches.

## Doors

The doors have stainless-steel door hinges and chrome-plated door fasteners.

## Internal barrier

The internal barrier is a grounded, perforated, metal barrier inside the outer door in front of switch to shield against accidental contact.

## Provisions for door padlocks

The front door (and rear door, if provided) is equipped with a hasp for use with purchaser's padlock.

## Steel structure

Each section is self-supporting and has 11-gauge steel panels with bolted frame.

## Ventilation

Standard ventilation louvers are located in the top and bottom, front and rear of each section.

## Bus bars

The bus bars are copper, silver-plated. Tin-plated is optional.

## Ground bus

Ground bus extends across the vertical section.

## Danger sign

Danger high-voltage sign provided on front and rear of each section.

Type SIEBREAK metal-enclosed interrupter switchgear with barriers removed



# Technical data

SIEBREAK metal-enclosed interrupter switchgear has been tested under short-circuit conditions in a recognized high-power test laboratory under UL procedures. Tests were performed in accordance with ANSI, IEEE, and CSA standards.

*The design tests extend beyond the switch-fuse assembly to also the enclosure assembly, including the venting system and the bus spacing and bracing, as well as mechanical life tests.*

Switchgear assembly ratings				
Maximum design voltage kV	Impulse withstand kV BIL	Main bus continuous current A	Momentary rms kA (fused)	Rated short-time current (2 second) (unfused)
5.0	60	1,200	39	25
5.0	60	1,200	59	38
5.0	60	1,200	78	38
5.0	60	2,000	39	25
5.0	60	2,000	59	38
5.0	60	2,000	78	38
15.0	95	1,200	39	25
15.0	95	1,200	59	38
15.0	95	1,200	78	38
15.0	95	2,000	39	25
15.0	95	2,000	59	38
15.0	95	2,000	78	38

Switch ratings				
Maximum design voltage kV	Impulse withstand kV BIL	Continuous current A	Momentary and fault close (unfused) rms kA	Short-time current (2 second) kA sym
5.0	60	600	39	25
5.0	60	600	59	38
5.0	60	1,200	39	25
5.0	60	1,200	59	38
15.0	95	600	39	25
15.0	95	600	59	38
15.0	95	1,200	39	25
15.0	95	1,200	59	38

**Footnote:**

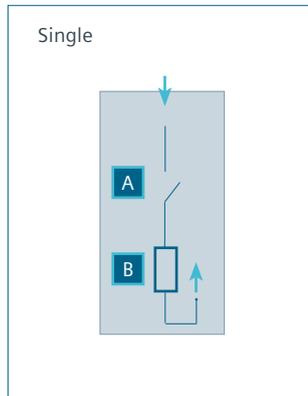
1. Not to exceed fuse rating. See below.

Primary fuse and interrupter rating			
Maximum design voltage kV	Fuse type	Ampere rating	Interrupting rating kA sym
5.0	CL-14	10E-600E	50
5.0	RBA400	10E-400E	37.5
5.0	RBA800	450E-720E	37.5
5.0	HCL	10E-600E	50
5.0	EJO-1	25E-450E	50
5.0	SM-5S	30E-400E	37.5
15.0	CL-14	10E-300E	50
15.0	RBA400	10E-400E	25
15.0	RBA800	450E-720E	25
15.0	HCL	10E-300E	50
15.0	EJO-1	25E-200E	50
15.0	SM-5S	30E-400E	25

Switch duty for full-load operations		
Maximum design voltage kV	Main bus continuous current A	ANSI required number of load-interrupting operations
5.0	600	50
5.0	1,200	20
15.0	600	30
15.0	1,200	10

# SIEBREAK switch types

A cost-effective alternative when low duty-cycle operations are needed



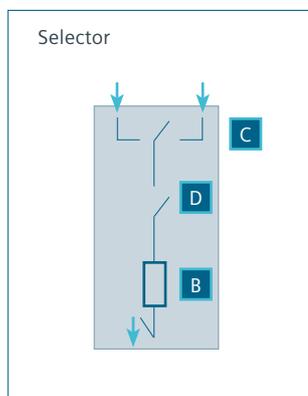
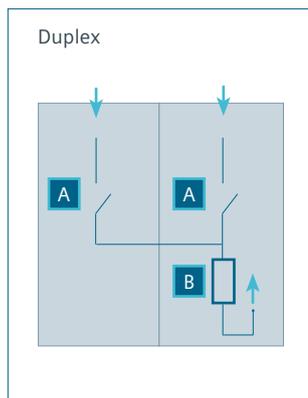
### Description

Siemens type SIEBREAK metal-enclosed interrupter switchgear provides a safe, easy-to-use, cost-effective, reliable, and flexible solution for switching and fault protection for medium-voltage circuits rated from 2.4 kV to 15 kV. SIEBREAK switchgear provides a manually-operated, single-throw, gang-operated switch mechanism for application where low duty-cycle operations are required. The advantage is that it is a cost-effective alternative to circuit breakers where high-duty operations are not needed while offering the characteristics critical for safety and system coordination.

SIEBREAK is available in three basic switch types:

- Single
- Duplex
- Selector.

These switch types are applicable for standalone, transformer primary, and lineup applications.



### Single-source applications

#### Single

Single vertical section equipped with one 600 A or 1,200 A load-interrupter switch rated up to 15 kV with cable incoming-line termination and load-cable termination. SIEBREAK offers cable direction for incoming and outgoing cable entry for either top or bottom and with an option for close-coupled line or load connection to dry or liquid-filled transformer.

### Dual-source applications

#### Duplex

Two close-coupled vertical sections each equipped with one 600 A or 1,200 A load-interrupter switch rated up to 15 kV. SIEBREAK offers incoming and outgoing cable direction for either top or bottom cable entry with an option for close-coupled load connection to dry- or liquid-filled type transformer.

### Selector

Single vertical section equipped with one 600 A load-interrupter switch rated up to 15 kV, 25 kA short time, 39 kA momentary, and one 600 A non-load-interrupting, two-position selector switch for selective source capability. SIEBREAK offers cable direction for incoming cable entry for either top or bottom and outgoing cables for bottom entry with an option for close-coupled load connection to dry- or liquid-filled type transformer.

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses
C	600 A non-load selector switch
D	600 A load-interrupting switch

# Application configuration

Standalone, transformer primary, and lineups

## Application configuration

Siemens SIEBREAK switchgear is used in many applications including standalone switch units, service entrance, substation transformer primary, and lineups including incoming line and feeders, main-tie-main, and automatic-transfer schemes.

A complete product line for various distribution applications:

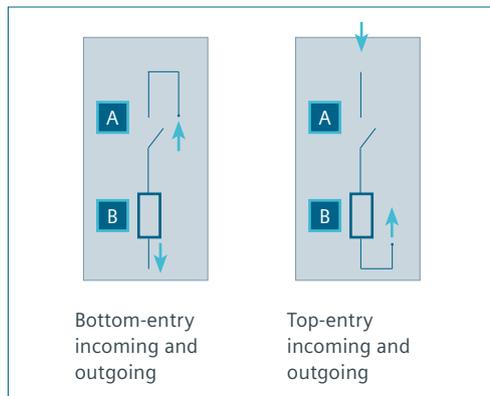
- Standalone
- Transformer primary
- Lineups (i.e., main-tie-main, main-feeders, automatic-transfer).



## Standalone bay

### Standalone bay - single

Single freestanding switch section with dimensions and weights shown in the table to the right. Ideal for a service entrance application where single-supply source is required for one outgoing feeder (usually not close-coupled to a transformer) for an industrial power user.



Standalone - single - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	62 (1,574)	36 (914)	92 (2,337)	1,450 (658)
5.0	Indoor	1,200	62 (1,574)	36 (914)	92 (2,337)	1,600 (726)
5.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,250 (1,021)
5.0	Outdoor	1,200	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,088)
15.0	Indoor	600	62 (1,574)	36 (914)	92 (2,337)	1,450 (658)
15.0	Indoor	1,200	62 (1,574)	36 (914)	92 (2,337)	1,600 (726)
15.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,250 (1,021)
15.0	Outdoor	1,200	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,088)

### Footnotes:

1. Line and load cables may be top or bottom entry.
2. Optional distribution, intermediate, or station surge arresters.
3. Optional voltage transformers, current transformers, and metering. Add 10" (254 mm) to depth.
4. Optional control power transformers. Add 10" (254 mm) to depth.
5. Reference the floor plan on pages 20-21, elevation views on pages 22-23, section views on pages 24-25, and transformer terminations on pages 26-29 when applicable.

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses

### Standalone bay - duplex

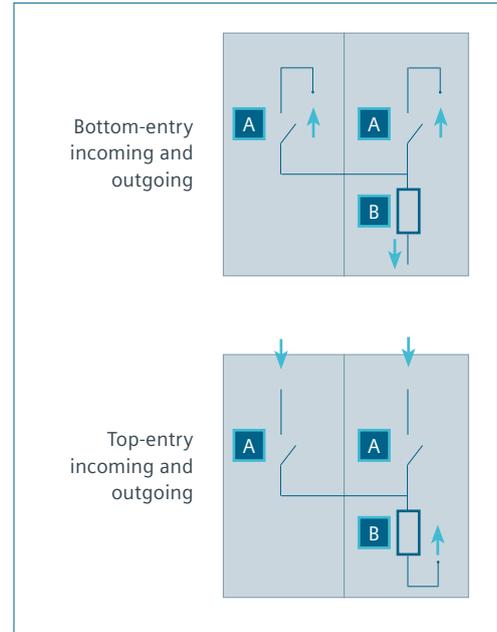
Two close-coupled freestanding switch sections with dimensions and weights shown in the table below. Ideal for a service entrance application where dual-supply source is required for one outgoing feeder (not close-coupled to a transformer) for an industrial power user.

Standalone - duplex - estimated dimensions and weight in inches (mm) or lbs (kg)

Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	72 (1,829)	72 (1,829)	92 (2,337)	2,850 (1,293)
5.0	Indoor	1,200	72 (1,829)	72 (1,829)	92 (2,337)	3,000 (1,361)
5.0	Outdoor	600	72 (1,829)	72 (1,829)	105 (2,667)	3,450 (1,565)
5.0	Outdoor	1,200	72 (1,829)	72 (1,829)	105 (2,667)	3,600 (1,633)
15.0	Indoor	600	72 (1,829)	72 (1,829)	92 (2,337)	2,850 (1,293)
15.0	Indoor	1,200	72 (1,829)	72 (1,829)	92 (2,337)	3,000 (1,361)
15.0	Outdoor	600	72 (1,829)	72 (1,829)	105 (2,667)	3,450 (1,565)
15.0	Outdoor	1,200	72 (1,829)	72 (1,829)	105 (2,667)	3,600 (1,633)

**Footnotes:**

1. Line and load cables may be top or bottom entry.
2. Optional distribution, intermediate, or station surge arresters.
3. Optional voltage transformers, current transformers, and metering.
4. Optional control power transformers - load connected and located in the non-fused section of the two sections.



Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses

### Standalone bay - selector

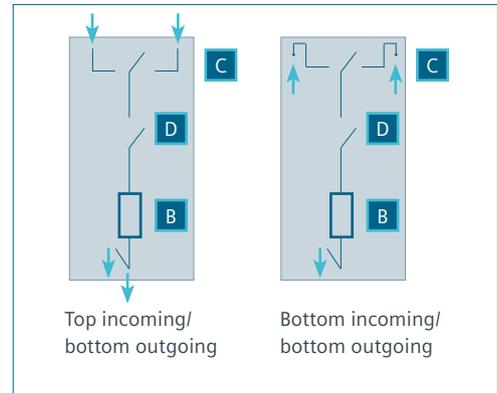
Single freestanding switch section with dimensions and weights shown in the table below. Ideal for a service entrance application where selective-supply source is required for one outgoing feeder (not close-coupled to a transformer) for an industrial power user.

Standalone - selector - estimated dimensions and weight in inches (mm) or lbs (kg)

Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	72 (1,829)	36 (914)	92 (2,337)	1,850 (839)
5.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,089)
15.0	Indoor	600	72 (1,829)	36 (914)	92 (2,337)	1,850 (839)
15.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,089)

**Footnotes:**

1. Load-side cable direction is bottom entry only (top exit is not available for load cables).
2. Optional distribution, intermediate, or station surge arresters.
3. No provision for auxiliary devices are available in this configuration.
4. Incoming line-side cables may be top or bottom entry.



Item	Description
B	Fuses
C	600 A non-load selector switch
D	600 A non-load-interrupting switch

## Transformer primary

Cable terminations provided for incoming line. The load termination is a close-coupled connection to a transformer primary.

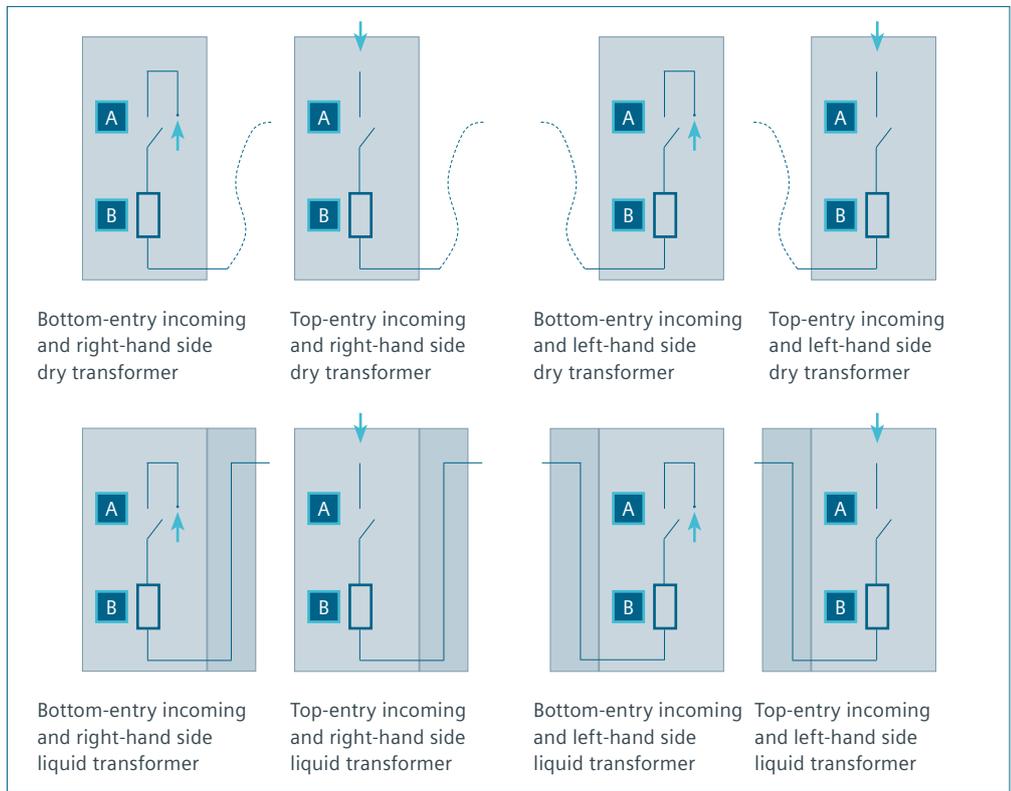
### Transformer primary - single

Single load-interrupter switch section with dimensions and weights shown in the table below. Ideal for single-source applications with outgoing close-coupled connection to the primary side of a dry or liquid-filled transformer for a low-voltage substation.

Transformer primary - single - estimated dimensions and weight in inches (mm) or lbs (kg)							
Maximum design voltage kV	Enclosure type	Transformer type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	Dry	600	62 (1,574)	36 (914)	92 (2,337)	1,600 (726)
5.0	Indoor	Dry	1,200	62 (1,574)	36 (914)	92 (2,337)	1,750 (794)
5.0	Indoor	Liquid-filled	600	62 (1,574)	54 (1,372)	92 (2,337)	2,500 (1,134)
5.0	Indoor	Liquid-filled	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,650 (1,202)
5.0	Outdoor	Dry	600	72 (1,829)	38 (965)	105 (2,667)	2,000 (907)
5.0	Outdoor	Dry	1,200	72 (1,829)	38 (965)	105 (2,667)	2,150 (975)
5.0	Outdoor	Liquid-filled	600	72 (1,829)	54 (1,372)	105 (2,667)	2,900 (1,315)
5.0	Outdoor	Liquid-filled	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,050 (1,383)
15.0	Indoor	Dry	600	62 (1,574)	36 (914)	92 (2,337)	1,600 (726)
15.0	Indoor	Dry	1,200	62 (1,574)	36 (914)	92 (2,337)	1,750 (794)
15.0	Indoor	Liquid-filled	600	62 (1,574)	54 (1,372)	92 (2,337)	2,500 (1,134)
15.0	Indoor	Liquid-filled	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,650 (1,202)
15.0	Outdoor	Dry	600	72 (1,829)	38 (965)	105 (2,667)	2,000 (907)
15.0	Outdoor	Dry	1,200	72 (1,829)	38 (965)	105 (2,667)	2,150 (975)
15.0	Outdoor	Liquid-filled	600	72 (1,829)	54 (1,372)	105 (2,667)	2,900 (1,315)
15.0	Outdoor	Liquid-filled	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,050 (1,383)

**Footnotes:**

- Optional distribution, intermediate, or station surge arresters for incoming-line terminations.
- Left- or right-side, dry- or liquid-filled type transformers are available.
- Liquid-filled and outdoor dry-type connection to be throat-type connection.
- Optional voltage transformers, current transformers, and metering. Refer to pages 31-34 for details.
- Optional control power transformer. Consult factory for depth requirements.



Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses

### Transformer primary - duplex

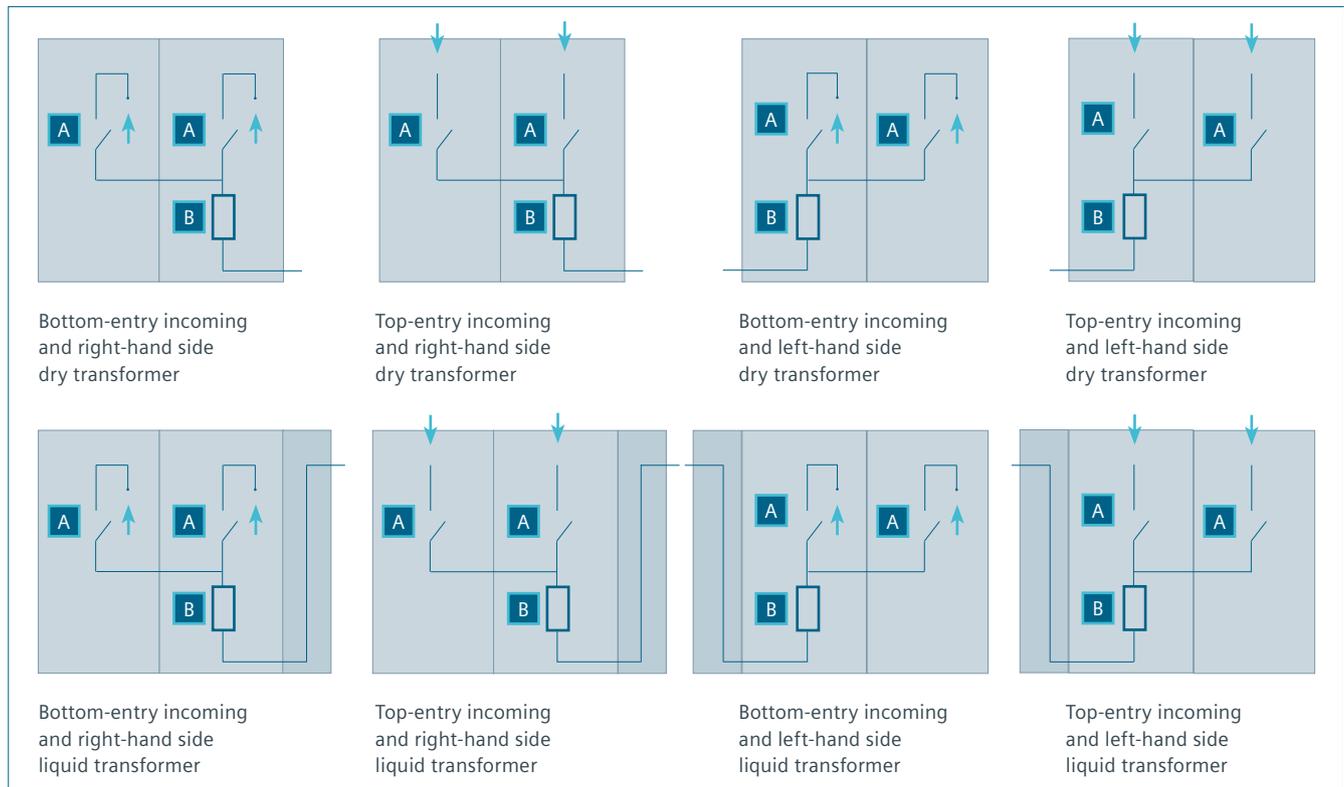
Two load-interrupter switch sections connected to one set of fuses with dimensions and weights shown in the table below. Ideal for dual-supply source applications for an outgoing, close-coupled connection to a primary side of a dry or liquid-filled transformer for a low-voltage substation.

**Footnotes:**

1. Optional distribution, intermediate, or station surge arresters for incoming-line terminations.
2. Left- or right-side, dry- or liquid-filled type transformers are available.
3. Liquid-filled and outdoor dry-type connection to be throat-type connection.
4. Optional voltage transformers, current transformers, and metering. Refer to pages 31-34 for details.
5. Optional control power transformer. Consult factory for depth requirements.

Transformer primary - duplex - estimated dimensions and weight in inches (mm) or lbs (kg)							
Maximum design voltage kV	Enclosure type	Transformer type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	Dry	600	72 (1,829)	72 (1,829)	92 (2,337)	3,000 (1,361)
5.0	Indoor	Dry	1,200	72 (1,829)	72 (1,829)	92 (2,337)	3,150 (1,428)
5.0	Indoor	Liquid-filled	600	72 (1,829)	90 (2,286)	92 (2,337)	3,700 (1,679)
5.0	Indoor	Liquid-filled	1,200	72 (1,829)	90 (2,286)	92 (2,337)	3,850 (1,746)
5.0	Outdoor	Dry	600	72 (1,829)	75 (1,905)	105 (2,667)	3,450 (1,565)
5.0	Outdoor	Dry	1,200	72 (1,829)	75 (1,905)	105 (2,667)	3,600 (1,633)
5.0	Outdoor	Liquid-filled	600	72 (1,829)	90 (2,286)	105 (2,667)	4,100 (1,850)
5.0	Outdoor	Liquid-filled	1,200	72 (1,829)	90 (2,286)	105 (2,667)	4,250 (1,928)
15.0	Indoor	Dry	600	72 (1,829)	72 (1,829)	92 (2,337)	3,000 (1,361)
15.0	Indoor	Dry	1,200	72 (1,829)	72 (1,829)	92 (2,337)	3,150 (1,428)
15.0	Indoor	Liquid-filled	600	72 (1,829)	90 (2,286)	92 (2,337)	3,700 (1,679)
15.0	Indoor	Liquid-filled	1,200	72 (1,829)	90 (2,286)	92 (2,337)	3,850 (1,746)
15.0	Outdoor	Dry	600	72 (1,829)	75 (1,905)	105 (2,667)	3,450 (1,565)
15.0	Outdoor	Dry	1,200	72 (1,829)	75 (1,905)	105 (2,667)	3,600 (1,633)
15.0	Outdoor	Liquid-filled	600	72 (1,829)	90 (2,286)	105 (2,667)	4,100 (1,850)
15.0	Outdoor	Liquid-filled	1,200	72 (1,829)	90 (2,286)	105 (2,667)	4,250 (1,928)

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses



### Transformer primary - selector

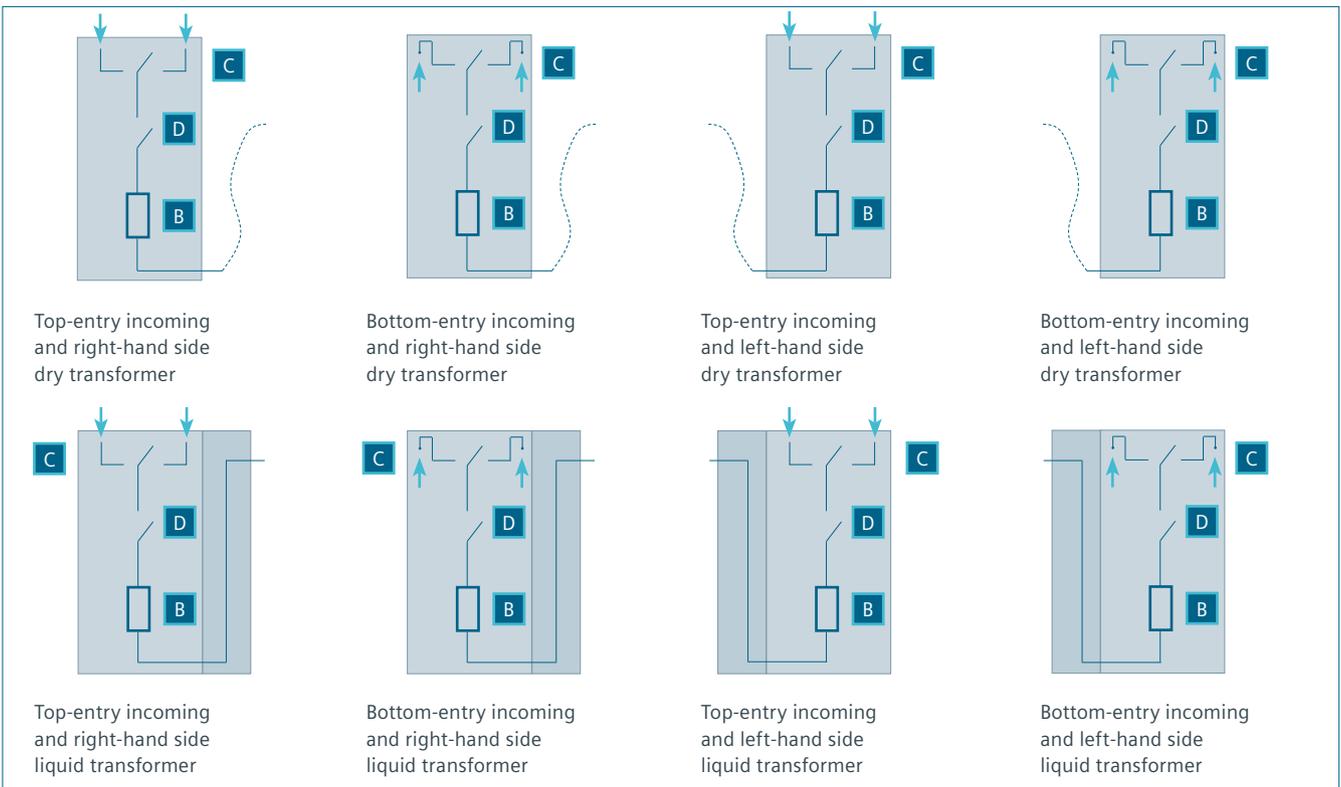
Single load-interrupter switch section with one non-load-interrupting selector switch and one set of fuses with dimensions and weights shown in the table below. Ideal for selective-supply source applications for an outgoing, close-coupled connection to a primary side of a dry or liquid-filled transformer for a low-voltage substation.

Transformer primary - selector - estimated dimensions and weight in inches (mm) or lbs (kg)							
Maximum design voltage kV	Enclosure type	Transformer type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	Dry	600	72 (1,829)	36 (914)	92 (2,337)	2,000 (907)
5.0	Indoor	Liquid-filled	600	72 (1,829)	54 (1,372)	92 (2,337)	2,700 (1,225)
5.0	Outdoor	Dry	600	72 (1,829)	39 (991)	105 (2,667)	2,400 (1,089)
5.0	Outdoor	Liquid-filled	600	72 (1,829)	54 (1,372)	105 (2,667)	2,900 (1,315)
15.0	Indoor	Dry	600	72 (1,829)	36 (914)	92 (2,337)	2,000 (907)
15.0	Indoor	Liquid-filled	600	72 (1,829)	54 (1,372)	92 (2,337)	2,700 (1,225)
15.0	Outdoor	Dry	600	72 (1,829)	39 (991)	105 (2,667)	2,400 (1,089)
15.0	Outdoor	Liquid-filled	600	72 (1,829)	54 (1,372)	105 (2,667)	2,900 (1,315)

**Footnotes:**

- Optional distribution, intermediate, or station surge arresters for incoming-line terminations.
- Left- or right-side, dry- or liquid-filled type transformers are available.
- Liquid-filled and outdoor dry-type connection to be throat-type connection.

Item	Description
B	Fuses
C	600 A non-load selector switch
D	600 A load-interrupting switch



## Lineups

Multiple vertical sections close-coupled and bus-connected together into a lineup configuration with one or more supply sources characterize lineup configuration types. SIEBREAK switchgear is available in the lineup configuration for section types including main, tie, and branch feeders. These section types are limited to the single-switch type (duplex and selector not available in a lineup) with main cross bus bars located in the top of the enclosure. Three section types are main, branch feeder, and tie.

### Lineups - main incomer

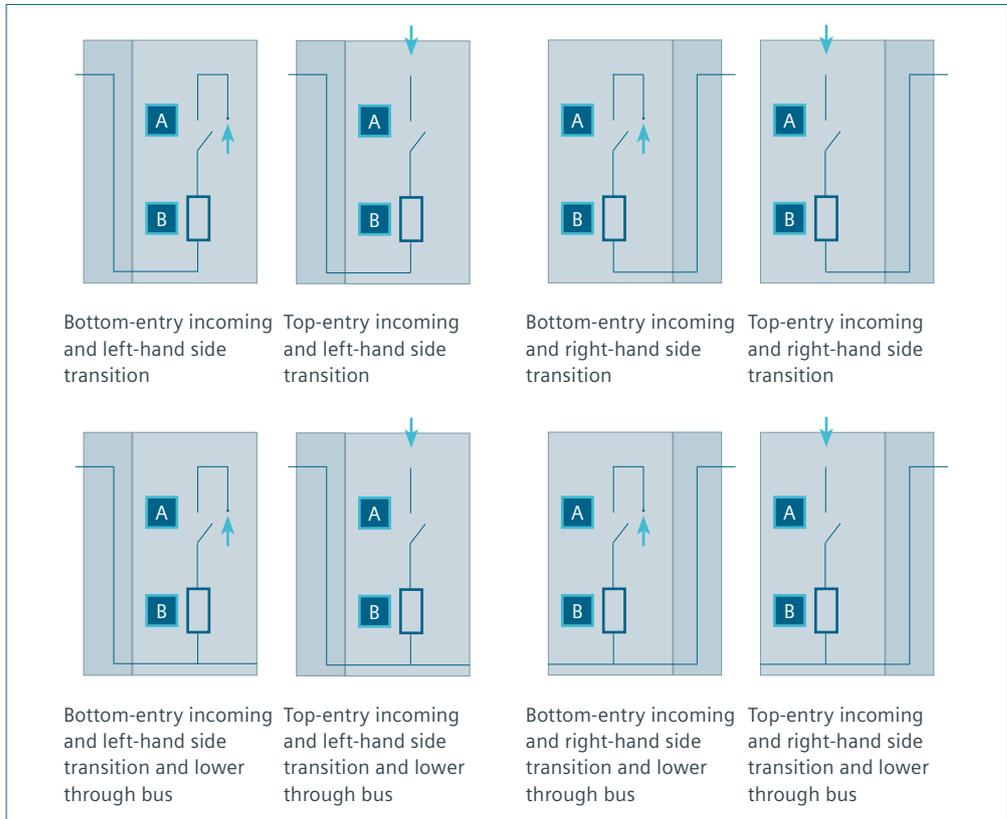
One vertical section is equipped with a 600 A or 1,200 A load-interrupter switch and one 18" (457 mm) bus transition section. The incoming-line cable termination is available for either top or bottom entry. Outgoing termination will be a close-coupled load connection with either left- or right-side transition to an adjacent vertical section of SIEBREAK branch feeders and tie panels.

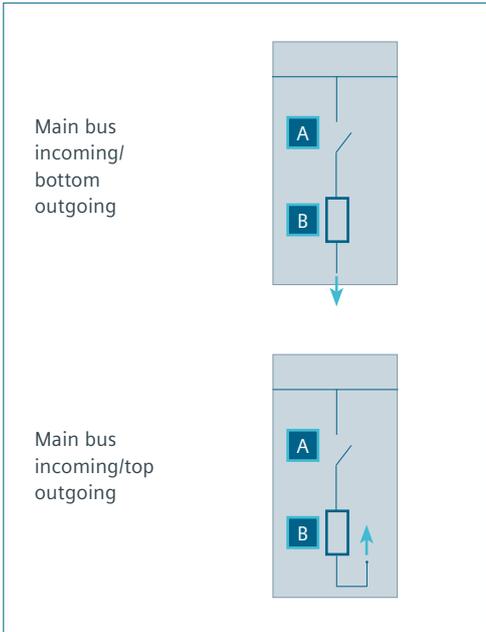
#### Footnotes:

1. Optional distribution, intermediate, or station surge arresters for incoming-line terminations.
2. Optional voltage transformers, for both incoming-line terminations.
3. Optional current transformers for load side of the switch.
4. Optional low-voltage compartment power metering.
5. Optional control power transformer. Consult factory for depth requirement.

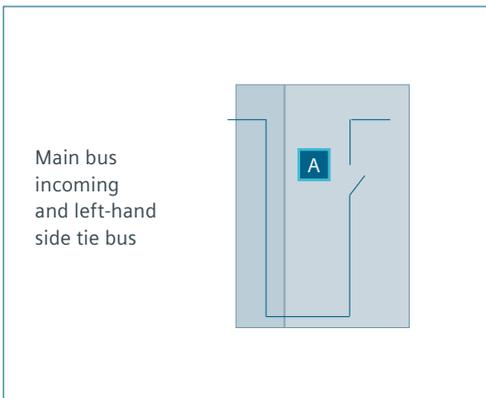
Lineups - main incomer - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	62 (1,574)	54 (1,372)	92 (2,337)	2,300 (1,043)
5.0	Indoor	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,450 (1,111)
5.0	Outdoor	600	72 (1,829)	54 (1,372)	105 (2,667)	3,150 (1,429)
5.0	Outdoor	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,300 (1,497)
15.0	Indoor	600	62 (1,574)	54 (1,372)	92 (2,337)	2,300 (1,043)
15.0	Indoor	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,450 (1,111)
15.0	Outdoor	600	72 (1,829)	54 (1,372)	105 (2,667)	3,150 (1,429)
15.0	Outdoor	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,300 (1,497)

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses





Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses



Item	Description
A	600 A or 1,200 A interrupter switch

### Lineups - branch

The branch-feeder type consists of one vertical section equipped with a 600 A or 1,200 A load-interrupter switch. The main bus is rated 1,200 A or 2,000 A<sup>5</sup> depending upon the application. The outgoing load terminations will be cables for either top or bottom entry.

Lineups - branch - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	62 (1,574)	36 (914)	92 (2,337)	1,800 (816)
5.0	Indoor	1,200	62 (1,574)	36 (914)	92 (2,337)	1,950 (885)
5.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,089)
5.0	Outdoor	1,200	72 (1,829)	36 (914)	105 (2,667)	2,550 (1,557)
15.0	Indoor	600	62 (1,574)	36 (914)	92 (2,337)	1,800 (816)
15.0	Indoor	1,200	62 (1,574)	36 (914)	92 (2,337)	1,950 (885)
15.0	Outdoor	600	72 (1,829)	36 (914)	105 (2,667)	2,400 (1,089)
15.0	Outdoor	1,200	72 (1,829)	36 (914)	105 (2,667)	2,550 (1,557)

**Footnotes:**

1. Optional distribution, intermediate, or station surge arresters.
2. Optional three current transformers for the load side of the switch.
3. Optional low-voltage compartment power metering.
4. Optional control power transformer. Consult factory for depth requirement.
5. 2,000 A bus is available when transitioning to GM-SG non-arc-resistant, metal-clad switchgear.

### Lineups - tie

The tie-switch type consists of one vertical section equipped with a 600 A or 1,200 A load-interrupter switch either fused or unfused plus an 18" (457 mm) transition section. The terminations will be either lower or upper main bus rated 1,200 A.

Lineups - tie - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	62 (1,574)	54 (1,372)	92 (2,337)	2,300 (1,043)
5.0	Indoor	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,450 (1,111)
5.0	Outdoor	600	72 (1,829)	54 (1,372)	105 (2,667)	3,150 (1,429)
5.0	Outdoor	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,300 (1,497)
15.0	Indoor	600	62 (1,574)	54 (1,372)	92 (2,337)	2,300 (1,043)
15.0	Indoor	1,200	62 (1,574)	54 (1,372)	92 (2,337)	2,450 (1,111)
15.0	Outdoor	600	72 (1,829)	54 (1,372)	105 (2,667)	3,150 (1,429)
15.0	Outdoor	1,200	72 (1,829)	54 (1,372)	105 (2,667)	3,300 (1,497)

**Footnotes:**

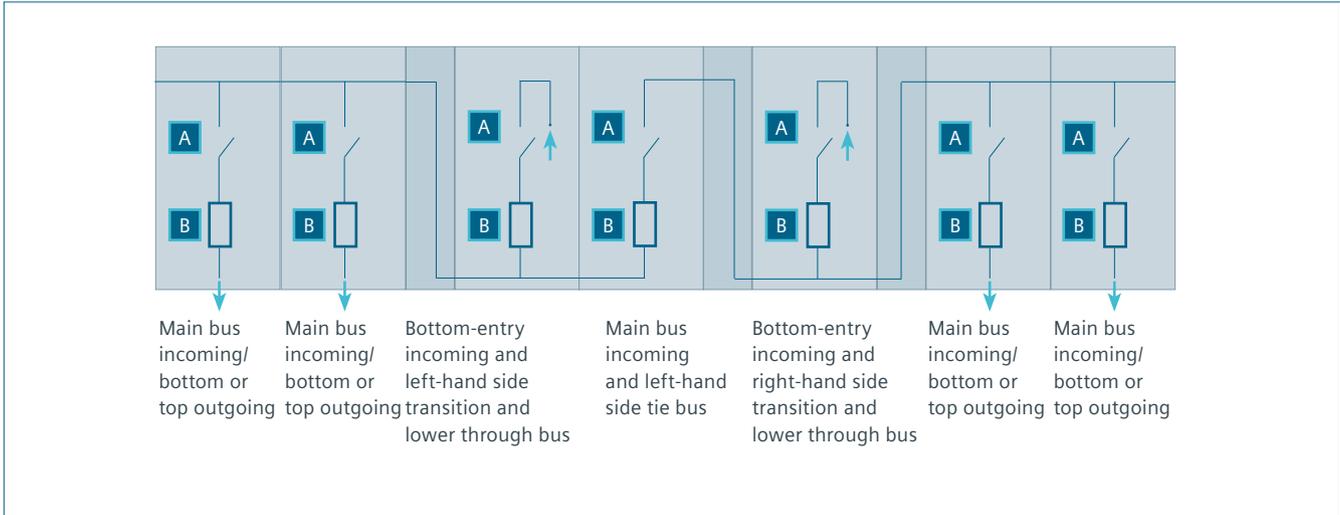
1. Optional distribution, intermediate, or station surge arresters.
2. Optional low-voltage compartment power metering.
3. Optional control power transformer. Consult factory for depth requirement.

## Lineup configurations

### Main-tie-main

This configuration consists of main, tie, and branch feeder switch types to provide a multi-source solution. It is also equipped with main cross bus up to 1,200 A.

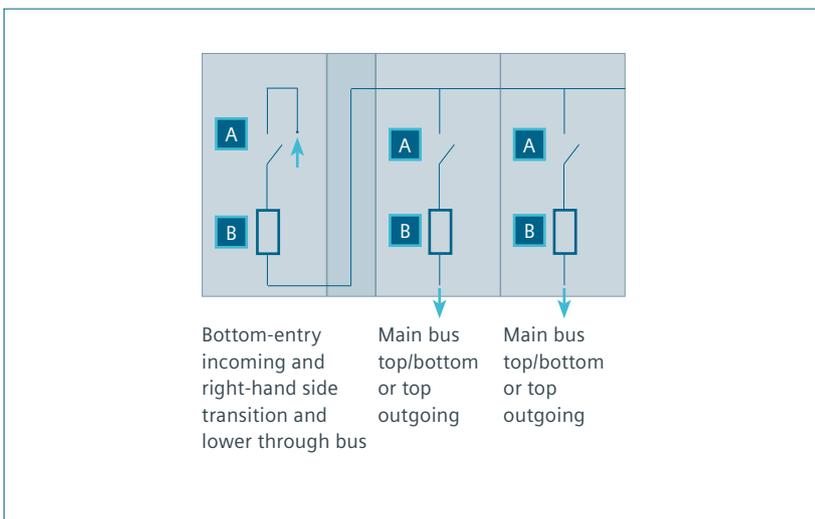
Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses



### Main feeder

This configuration consists of main and branch feeder switch types. It is also equipped with main cross bus up to 1,200 A.

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses



## Front-access configurations

SIEBREAK front-access design offers a space-savings option enabling the user to install the rear of the switchgear near a wall in an electrical room or power equipment center. The front-access design is available in single switch type (not available for duplex and selector) and available as a lineup for the single-switch type (not for duplex and selector).

### Standalone

All cable terminations for both incoming-line and outgoing-load terminations characterize the standalone configuration type.

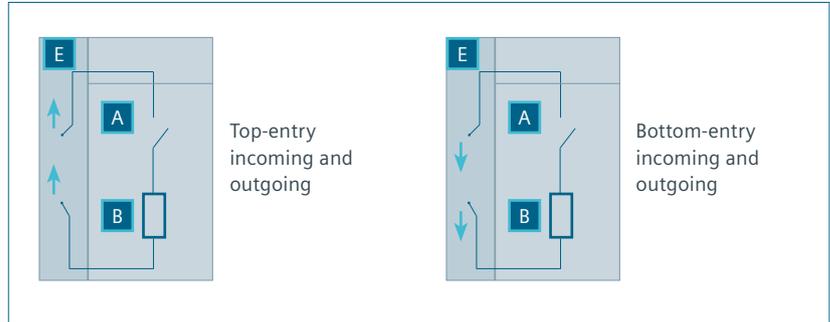
Item	Description
A	600 A interrupter switch
B	Fuses
E	Cable-pull section

#### Footnotes:

1. Optional distribution, intermediate, or station surge arresters.
2. Outdoor enclosure not available for front access.
3. Auxiliary device not available.

### Single - front access

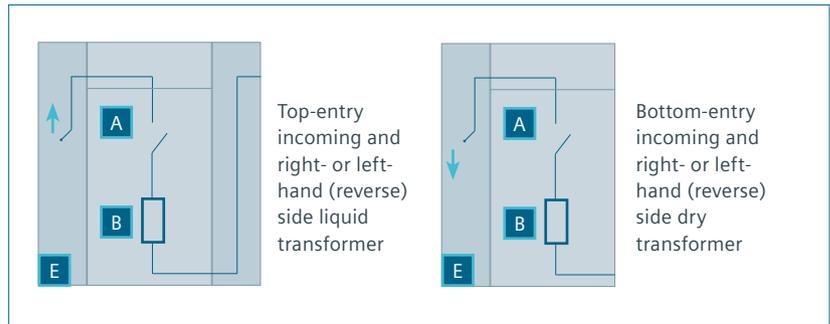
Single freestanding-switch panel and cable-pull section with dimensions and weights shown in the table below. Ideal for service-entrance applications and tight spaces for a single-supply source for one outgoing feeder (not close coupled to a transformer) for an industrial power user.



Single - front access - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	56 (1,422)	60 (1,524)	92 (2,337)	2,450 (1,111)
5.0	Indoor	1,200	56 (1,422)	60 (1,524)	92 (2,337)	2,600 (1,179)
15.0	Indoor	600	56 (1,422)	60 (1,524)	92 (2,337)	2,450 (1,111)
15.0	Indoor	1,200	56 (1,422)	60 (1,524)	92 (2,337)	2,600 (1,179)

### Single - transformer primary - front access

Single load-interrupter switch panel with dimensions and weights shown in the table below. Suited for single-source applications with outgoing close-coupled connection to primary side of a dry or liquid-filled transformer for a low-voltage substation.



Single - transformer primary - front access - estimated dimensions and weight in inches (mm) or lbs (kg)							
Maximum design voltage kV	Enclosure type	Transformer type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	Dry	600	56 (1,422)	60 (1,524)	92 (2,337)	2,375 (1,077)
5.0	Indoor	Dry	1,200	56 (1,422)	60 (1,524)	92 (2,337)	2,525 (1,145)
5.0	Indoor	Liquid-filled	600	56 (1,422)	78 (1,981)	92 (2,337)	3,225 (1,463)
5.0	Indoor	Liquid-filled	1,200	56 (1,422)	78 (1,981)	92 (2,337)	3,375 (1,531)
15.0	Indoor	Dry	600	56 (1,422)	60 (1,524)	92 (2,337)	2,375 (1,077)
15.0	Indoor	Dry	1,200	56 (1,422)	60 (1,524)	92 (2,337)	2,525 (1,145)
15.0	Indoor	Liquid-filled	600	56 (1,422)	78 (1,981)	92 (2,337)	3,225 (1,463)
15.0	Indoor	Liquid-filled	1,200	56 (1,422)	78 (1,981)	92 (2,337)	3,375 (1,531)

Item	Description
A	1,200 A interrupter switch
B	Fuses
E	Cable-pull section

#### Footnotes:

1. Optional distribution, intermediate, or station surge arresters.
2. Outdoor enclosure not available for front access.
3. Auxiliary device not available.

## Lineups - front access

Multiple vertical sections close-coupled and bus-connected together into a lineup configuration with one or more supply sources characterize lineup configuration types. SIEBREAK switchgear is available in the lineup configuration for section types including main, tie, and branch feeders. These section types are limited to the single-switch type (duplex and selector not available in a lineup) with main cross bus bars located in the top of the enclosure.

### Lineups - main incomer - front access

A lineup consists of a vertical section is equipped with a 600 A or 1,200 A load-interrupter switch, an incoming cable-pull section, and one 18" (457 mm) bus transition section. The incoming-line cable termination is available for either top or bottom entry. Outgoing termination will be close-coupled load connection either left- or right-side transition to an adjacent vertical section of front-access SIEBREAK branch feeders and tie panel.

Lineups - main incomer front access - estimated dimensions and weight in inches (mm) or lbs (kg)

Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	56 (1,422)	60 (1,524)	92 (2,337)	3,275 (1,486)
5.0	Indoor	1,200	56 (1,422)	60 (1,524)	92 (2,337)	3,425 (1,554)
15.0	Indoor	600	56 (1,422)	60 (1,524)	92 (2,337)	3,275 (1,486)
15.0	Indoor	1,200	56 (1,422)	60 (1,524)	92 (2,337)	3,425 (1,554)

### Lineups - branch - front access

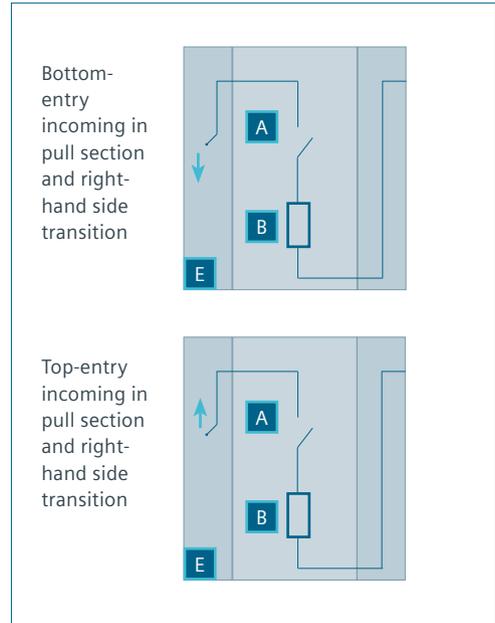
The branch-feeder type consists of one vertical section equipped with a 600 A or 1,200 A load-interrupter switch. The incoming will be main bus rated 1,200 A or 2,000 A<sup>5</sup> depending upon the application. The outgoing load terminations will be cables for either top or bottom entry.

Lineups - branch - estimated dimensions and weight in inches (mm) or lbs (kg)

Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	56 (1,422)	60 (1,524) <sup>6</sup>	92 (2,337)	1,775 (805)
5.0	Indoor	1,200	56 (1,422)	60 (1,524) <sup>6</sup>	92 (2,337)	1,925 (873)
15.0	Indoor	600	56 (1,422)	60 (1,524) <sup>6</sup>	92 (2,337)	1,775 (805)
15.0	Indoor	1,200	56 (1,422)	60 (1,524) <sup>6</sup>	92 (2,337)	1,925 (873)

**Footnotes:**

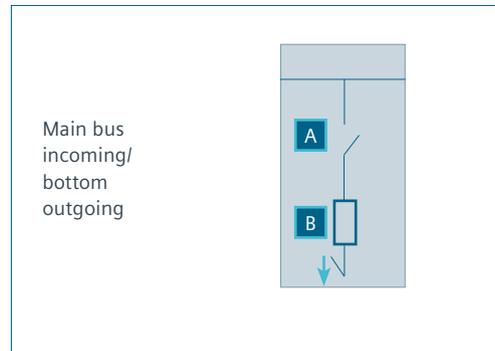
- Optional distribution, intermediate, or station surge arresters.
- Outdoor enclosure not available for front access.
- No provisions for auxiliary devices.
- Limited to E fuse.
- 2,000 A bus is available when transitioning to GM-SG non-arc-resistant, metal-clad switchgear.
- Width 60" (1,422 mm) for top exit load-side cables. Width 36" (914 mm) for bottom exit load-side cables.



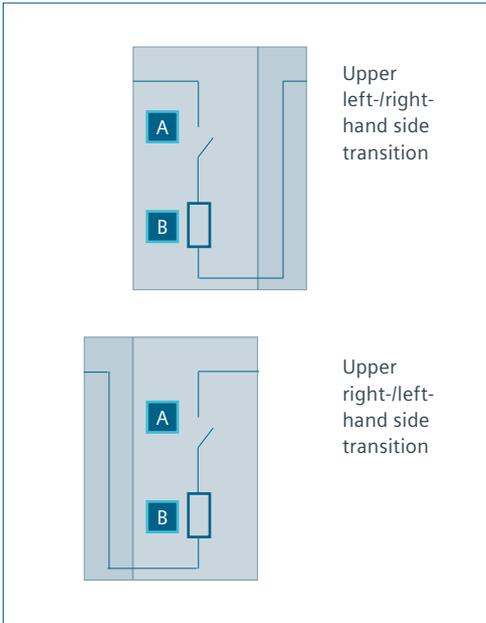
Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses
E	Cable-pull section

**Footnotes:**

- Optional distribution, intermediate, or station surge arresters.
- Outdoor enclosure not available for front access.
- No provisions for auxiliary devices.



Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses



### Lineups - tie - front access

The tie-switch type consists of one vertical section equipped with a 600 A or 1,200 A load-interrupter switch either fused or unfused plus an 18" (457 mm) transition section. The terminations will be either lower or upper main bus rated 1,200 A.

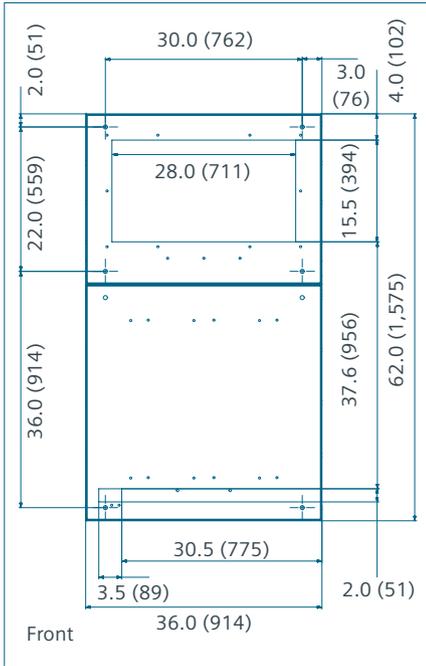
Lineups - tie - estimated dimensions and weight in inches (mm) or lbs (kg)						
Maximum design voltage kV	Enclosure type	Continuous current A	Depth	Width	Height	Weight
5.0	Indoor	600	56 (1,422)	54 (1,372)	92 (2,337)	2,175 (987)
5.0	Indoor	1,200	56 (1,422)	54 (1,372)	92 (2,337)	2,325 (1,055)
15.0	Indoor	600	56 (1,422)	54 (1,372)	92 (2,337)	2,175 (987)
15.0	Indoor	1,200	56 (1,422)	54 (1,372)	92 (2,337)	2,325 (1,055)

**Footnotes:**

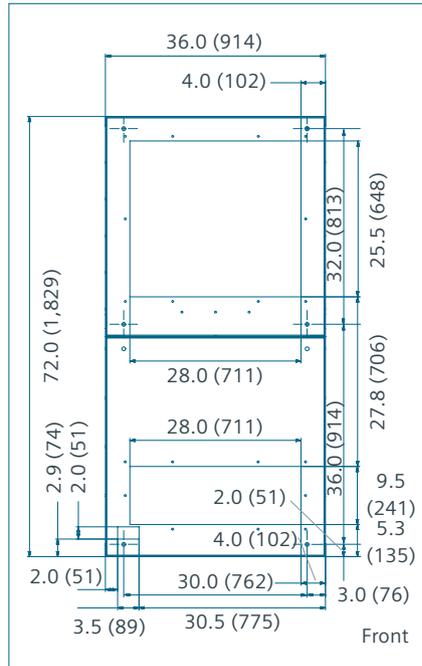
1. Optional distribution, intermediate, or station surge arresters.
2. Outdoor enclosure not available for front access.
3. No provisions for auxiliary devices.

Item	Description
A	600 A or 1,200 A interrupter switch
B	Fuses

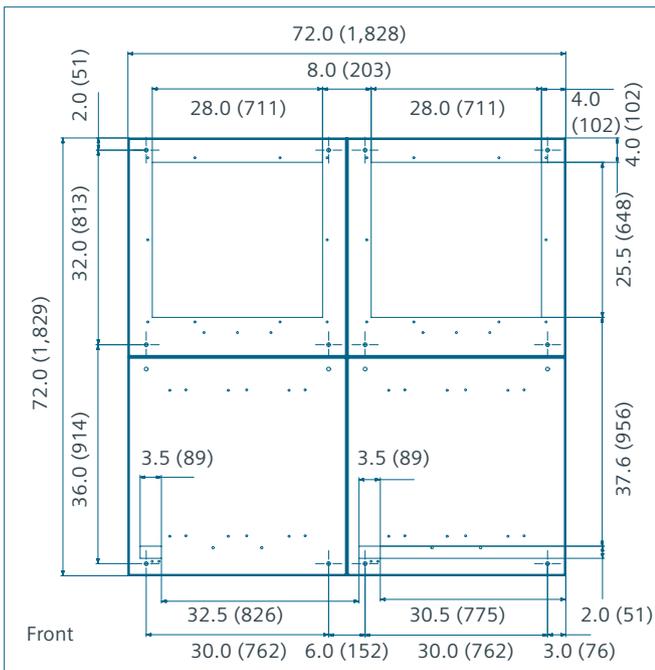
# Floor plans and anchoring



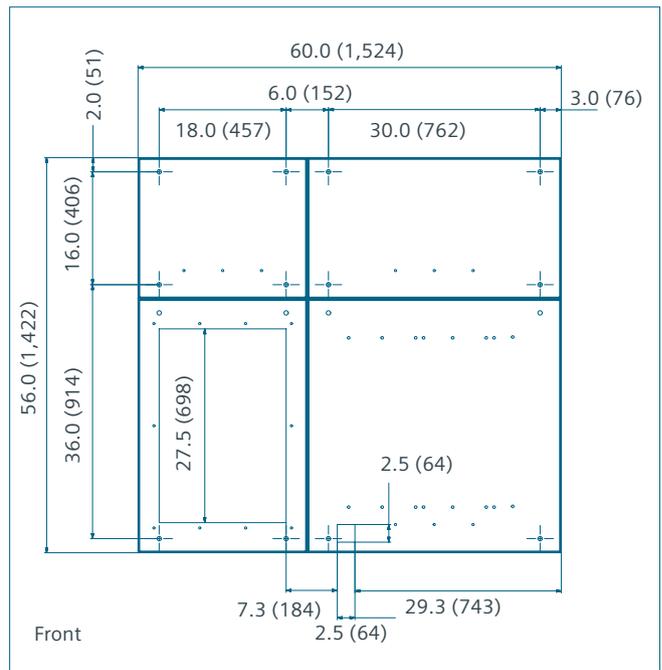
36" (914) wide, 62" (1,575 mm) deep floor plan



36" (914), wide 72" (1,829) deep floor plan

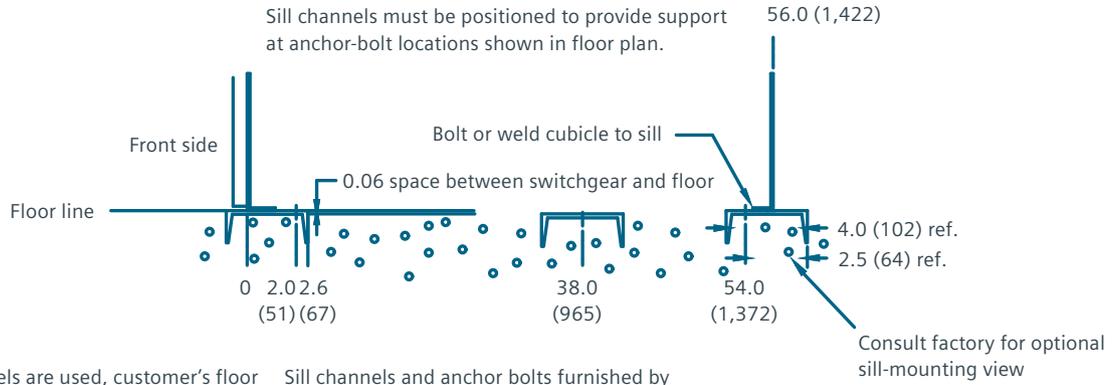


72" (1,829), wide 72" (1,829) deep duplex floor plan



60" (1,524), wide 56" (1,422) deep floor plan

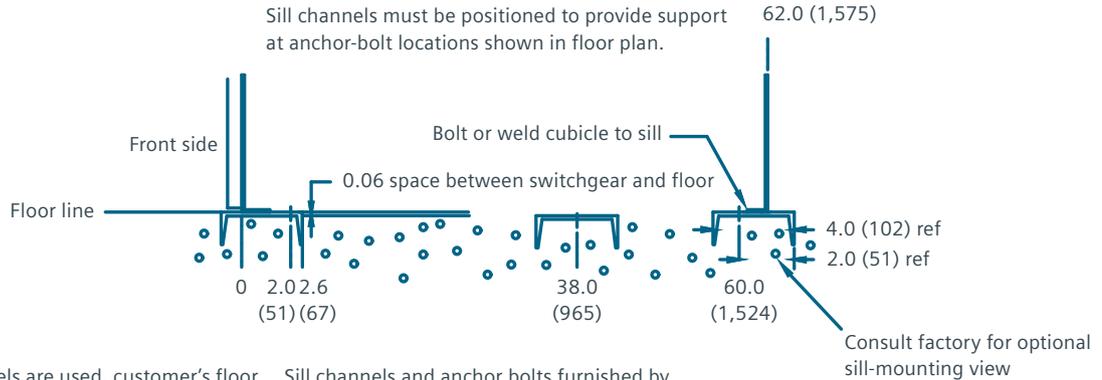
60" (1,524) wide, 56" (1,422) tall anchoring



When sill channels are used, customer's floor must not project above mounting surface or channels at any point within the floor area covered by the switchgear cubicles.

Sill channels and anchor bolts furnished by customer unless covered by contract.  
Conduit height not to exceed 1.5" (38) above floor line.

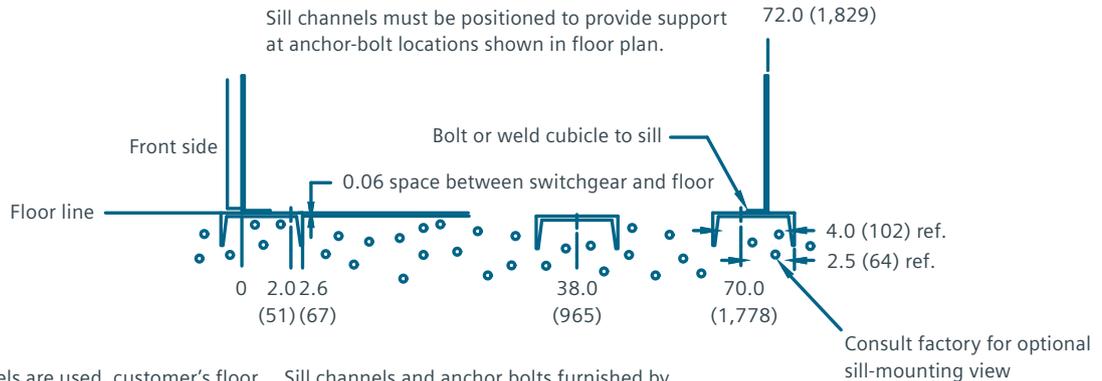
60" (1,524) wide, 62" (1,575) tall anchoring



When sill channels are used, customer's floor must not project above mounting surface or channels at any point within the floor area covered by the switchgear cubicles.

Sill channels and anchor bolts furnished by customer unless covered by contract.  
Conduit height not to exceed 1.5" (38) above floor line.

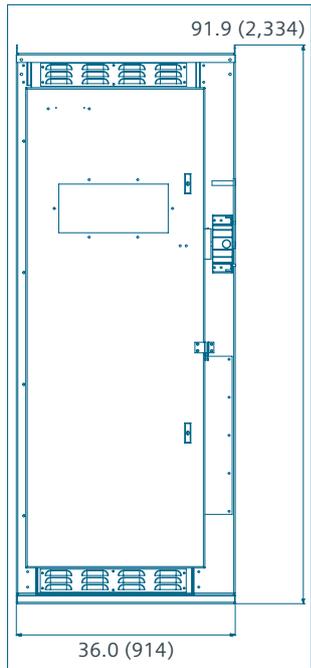
60" (1,524) wide, 72" (1,829) tall anchoring



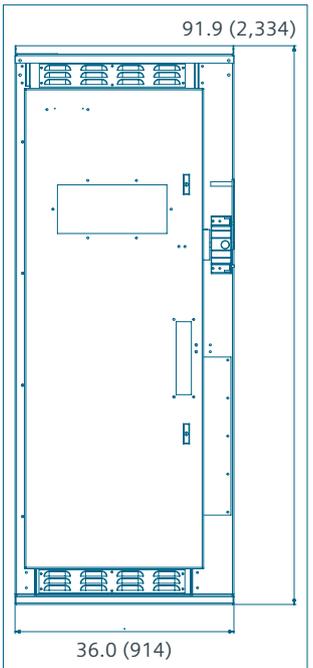
When sill channels are used, customer's floor must not project above mounting surface or channels at any point within the floor area covered by the switchgear cubicles.

Sill channels and anchor bolts furnished by customer unless covered by contract.  
Conduit height not to exceed 1.5" (38) above floor line.

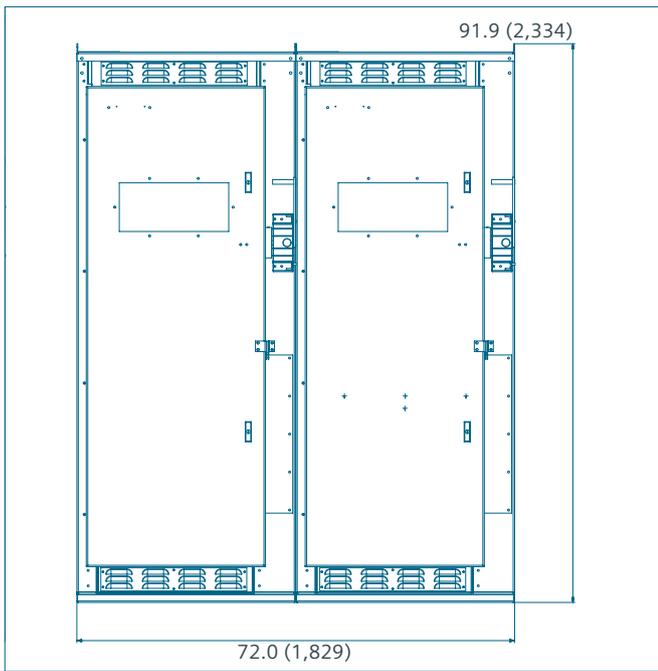
# Evaluation views



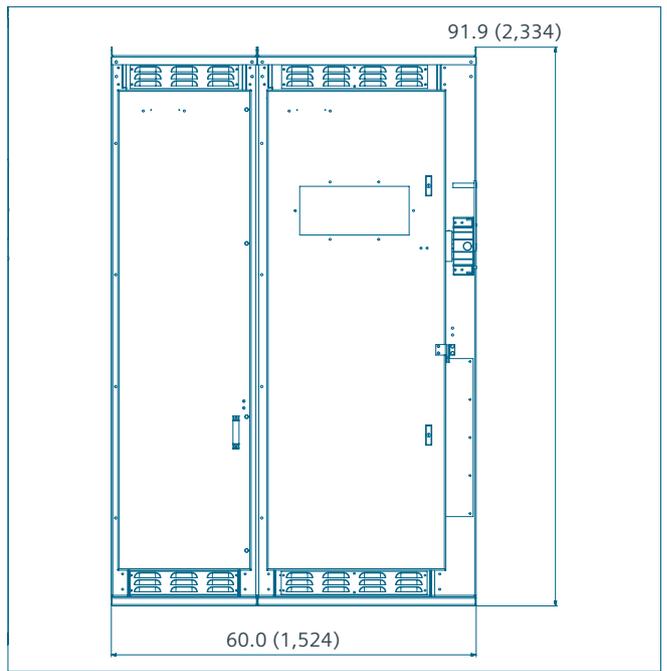
Single switch



Selector switch

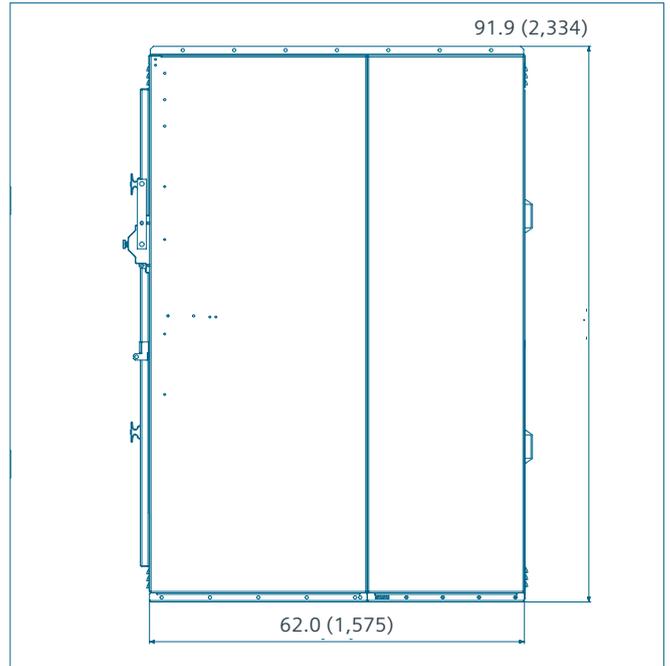


Duplex switch

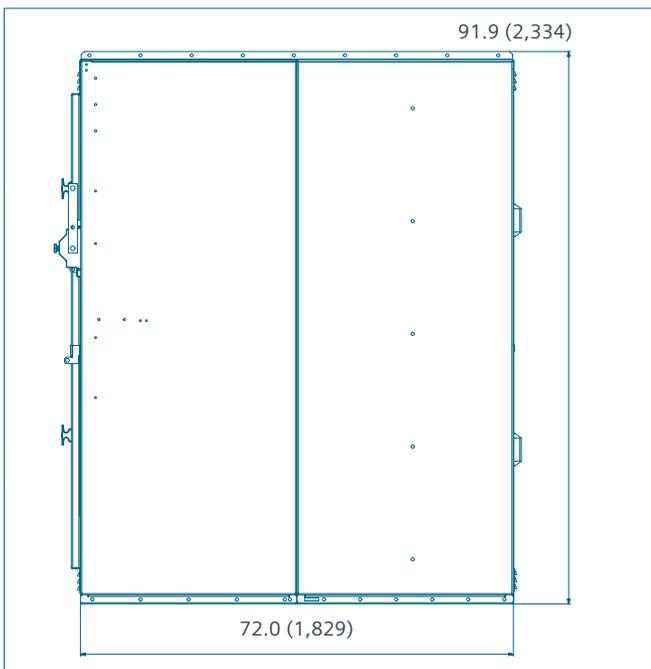


Single switch front access

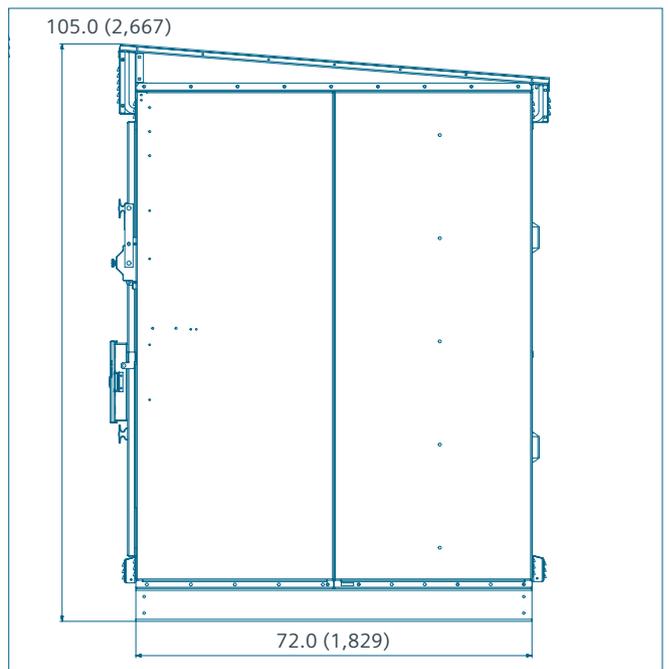
## Side views



Indoor - single switch 62"

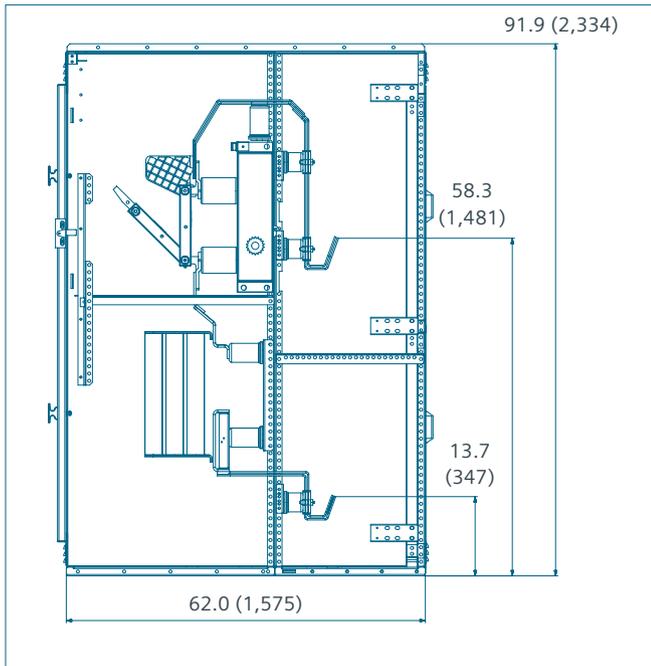


Indoor - single, duplex or selector switch 72"

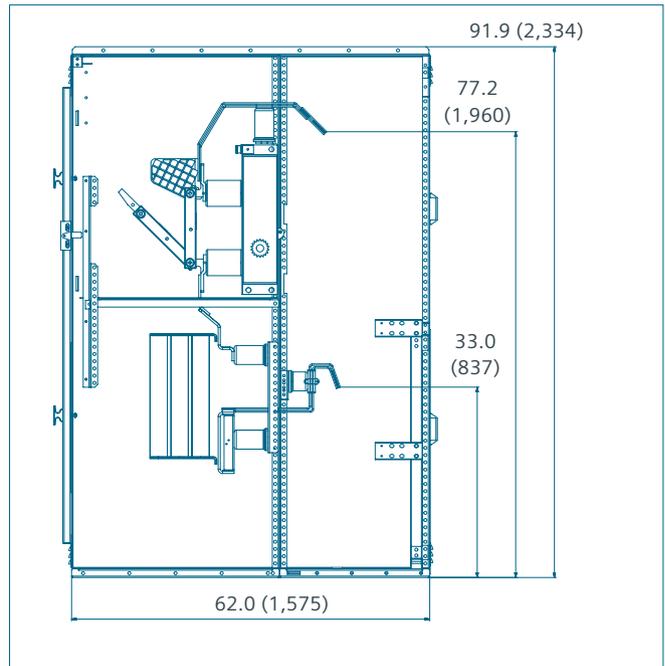


Outdoor - single, duplex, or selector switch

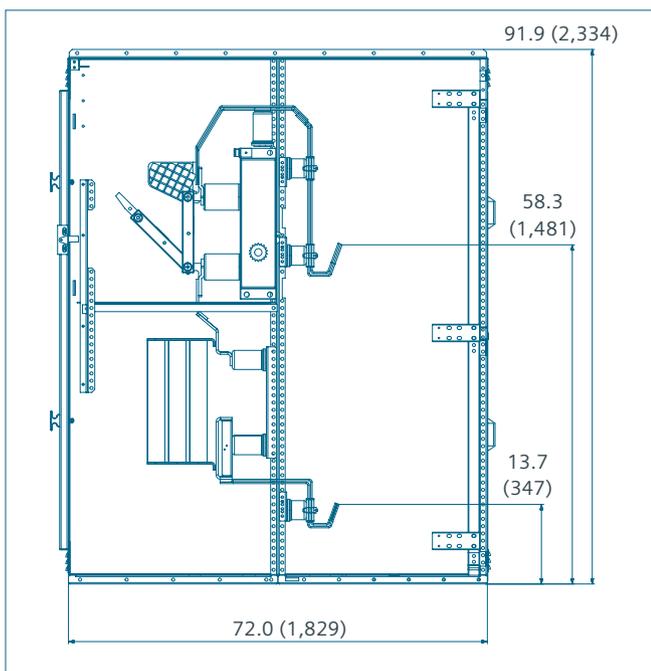
# Section views



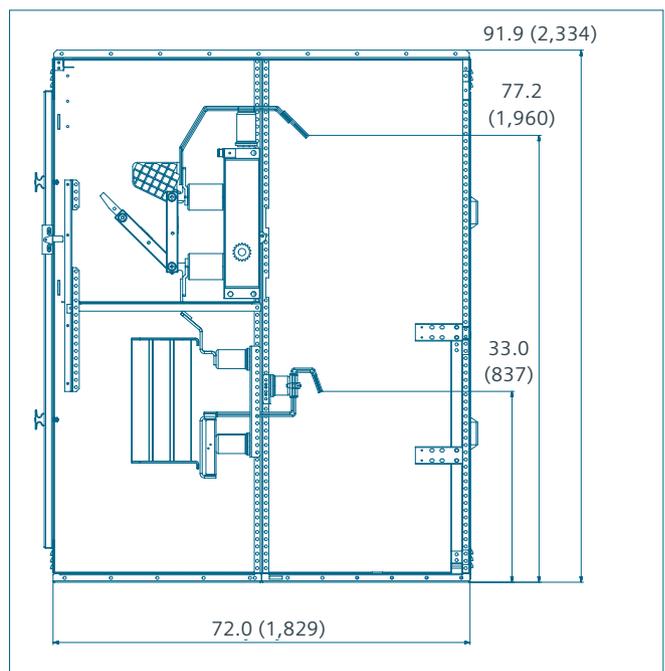
Single - top entry 62.0" (1,575 mm)



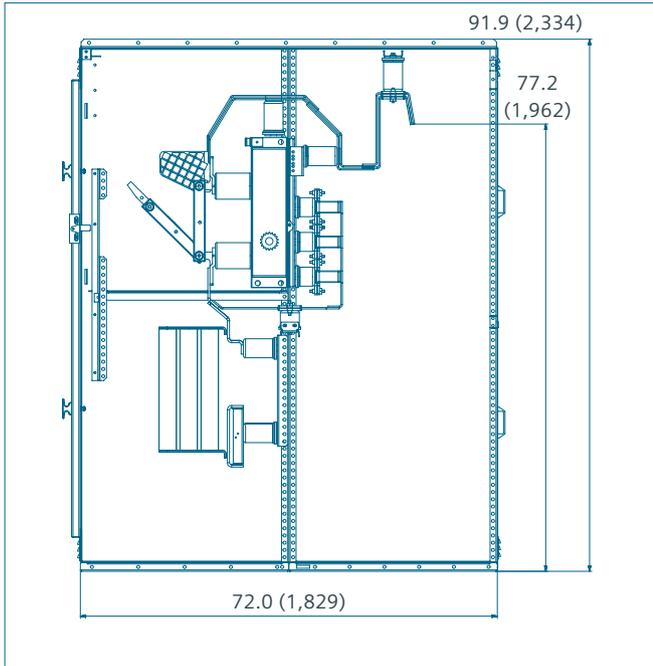
Single - bottom entry 62.0" (1,575 mm)



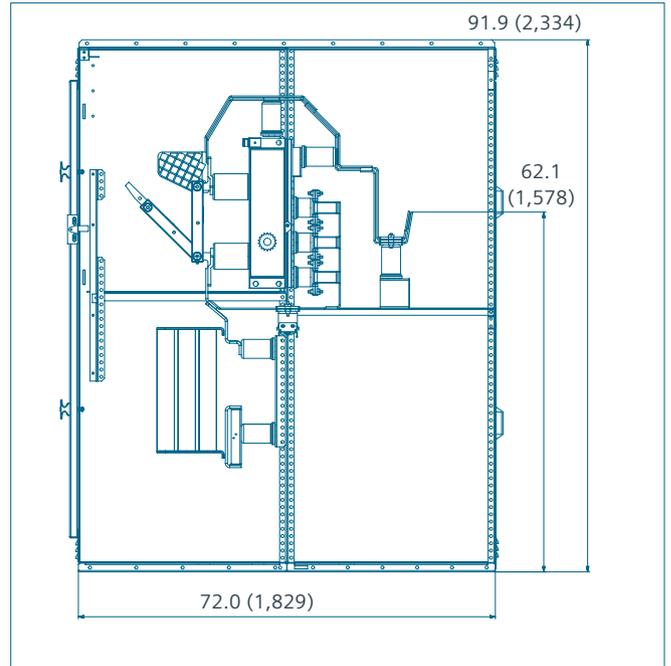
Single - top entry 72" (1,829 mm)



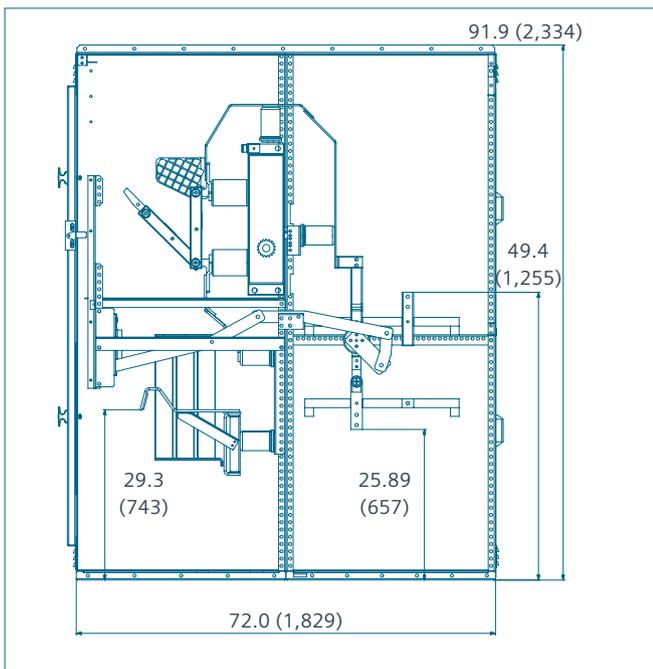
Single - bottom entry 72" (1,829 mm)



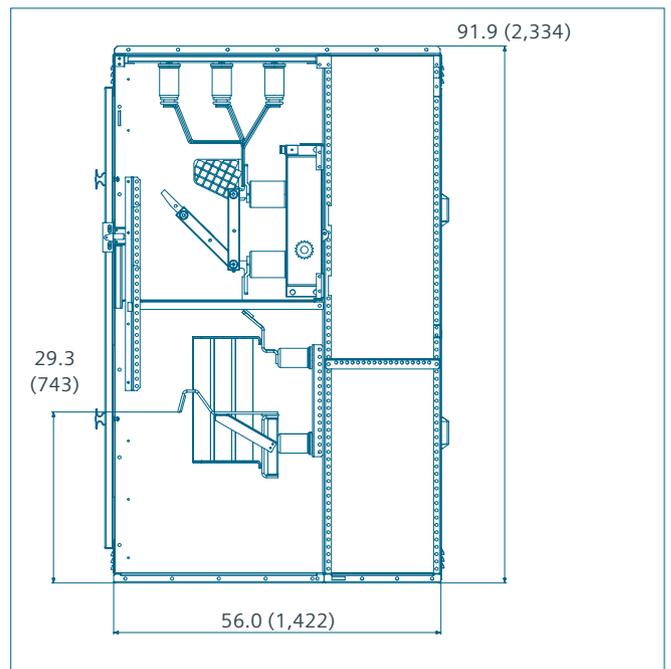
Duplex - bottom entry



Duplex - top entry



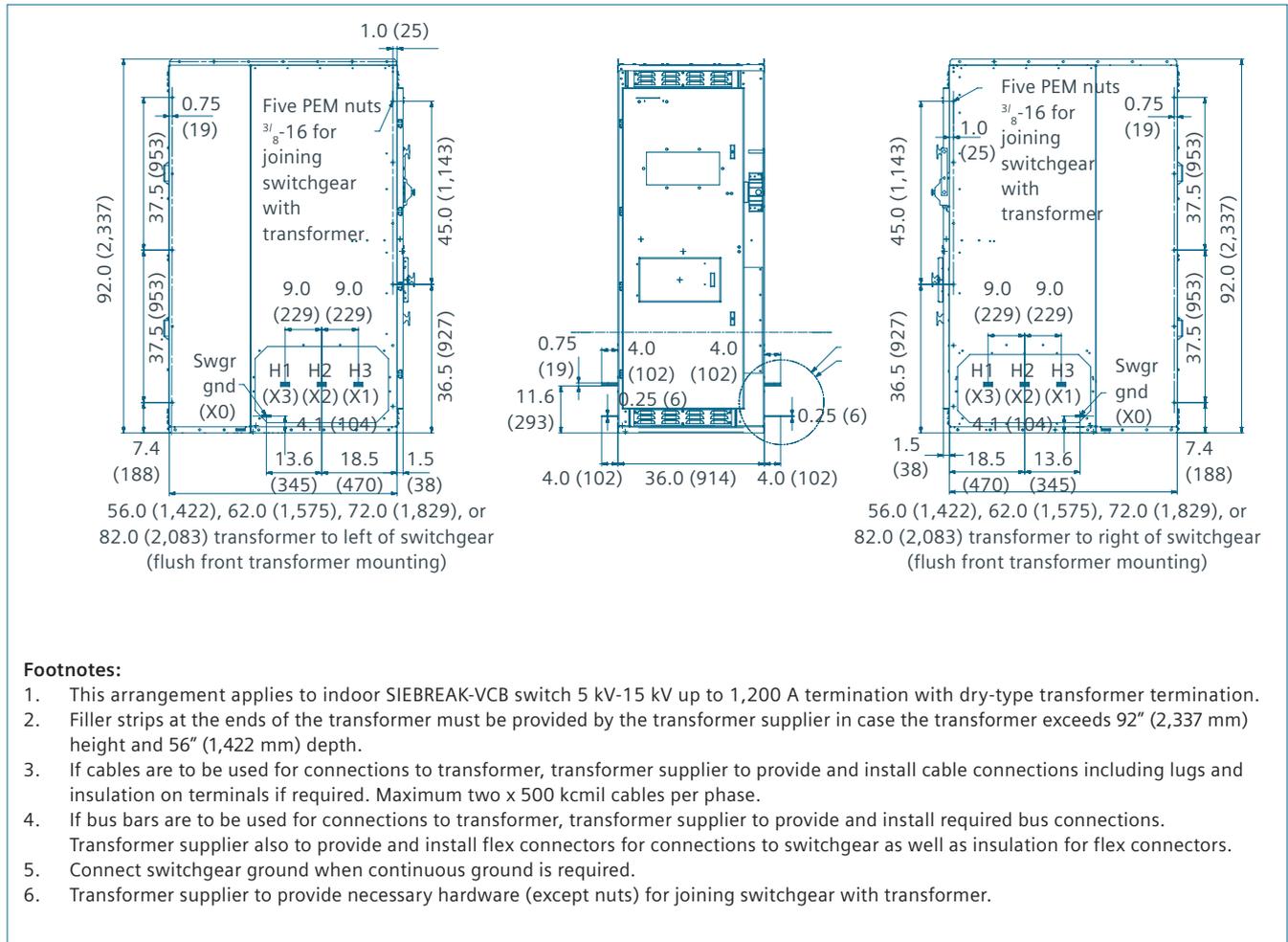
Selector



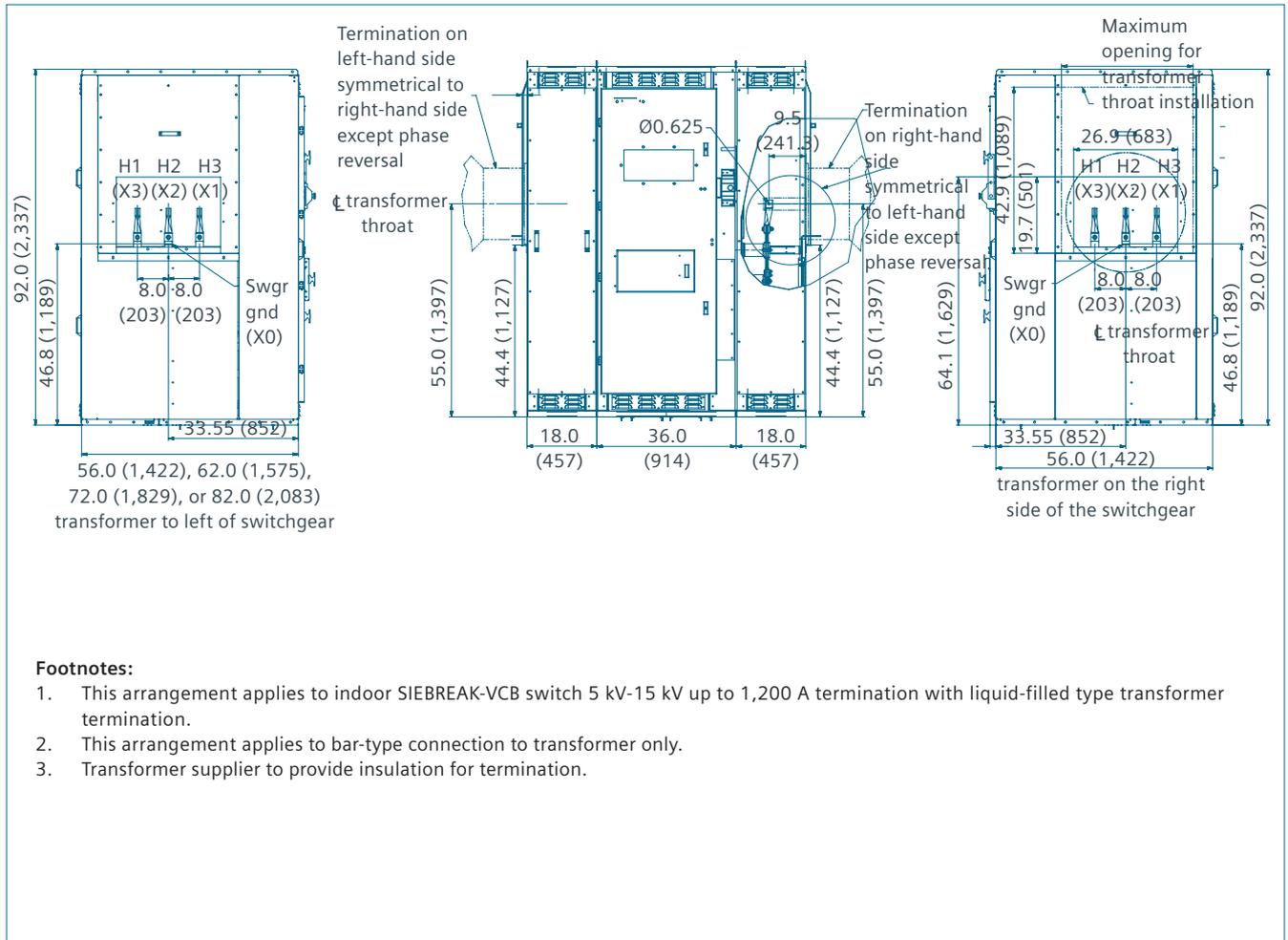
Single - front access

# Transformer terminations

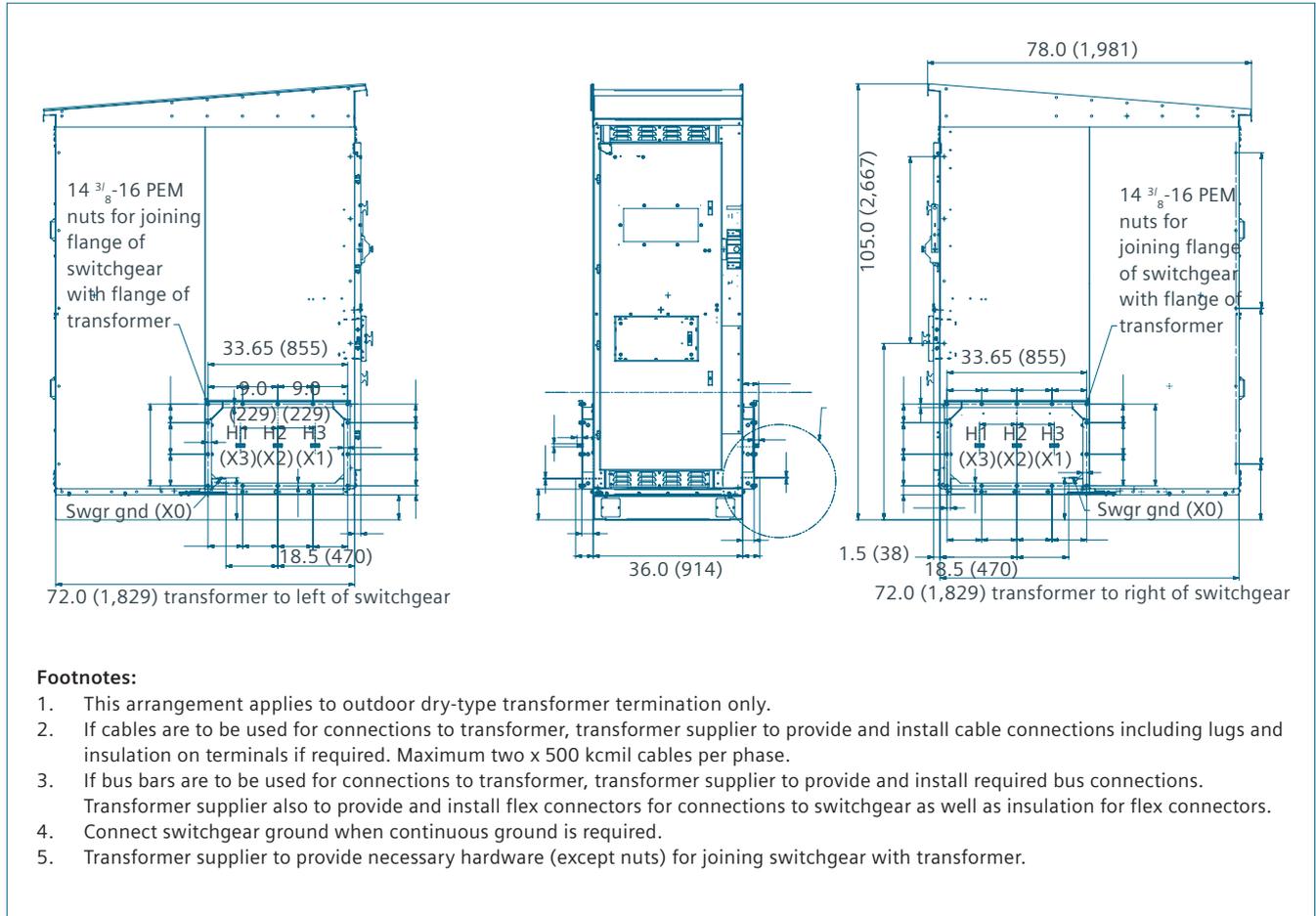
## Indoor - dry transformer



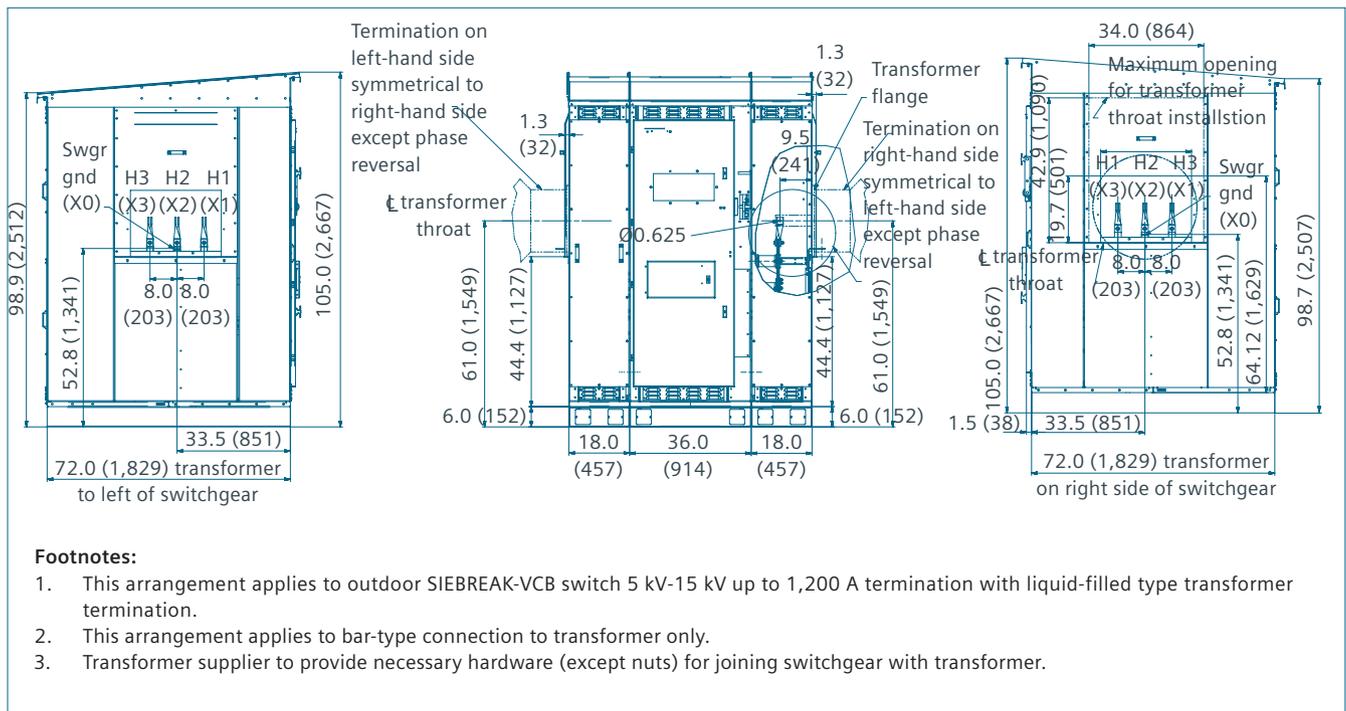
## Indoor - liquid-filled transformer



## Outdoor - dry transformer



## Outdoor - liquid-filled transformer



# Fuse ratings and selection

SIEBREAK switchgear can be specified with either current-limiting or expulsion type (power) fuses

## Fuse ratings and selection

The following tables show suggested fuse sizes for transformers based on system voltage and the self-cooled kVA capacity.

**Note:** current-limiting fuses significantly increase the integrated short-circuit rating because of their energy-limiting capabilities. To increase the short-circuit rating of the entire lineup of switchgear, current-limiting fuses must be used in the entrance bays.

### Footnotes:

1. Fuse CL-14 is Mersen current-limiting type. RBA400 and RBA800 are Eaton expulsion types.
2. Equivalent MVA is listed only for informational purposes.
3. Fuse minimum size listed allows transformer magnetizing inrush current. 133-percent fuse allows for 133-percent forced-cooled transformer rating. Maximum fuse size shown is either maximum size for the fuse type or the maximum size fuse recommended.
4. Fuse type RBA800 uses two fuses in parallel with 10-percent reduction in rating to allow for unequal current sharing. 450E uses two 250E fuses, 540E uses two 300E fuses, and 720E uses two 400E fuses.
5. Fuse sizes are E ratings, e.g., 100 designates 100E.
6. 25 kA as Eaton limits peak current to 65 kA.  
65 kA/2.6 = 25 kA symmetrical.

Fuse selection guide for transformers from 500 kVA to 6,000 kVA <sup>3,5</sup>													
System voltage	Fuse type <sup>1,4</sup>	Symmetrical interrupting kA	Equivalent MVA <sup>2</sup>	500 kVA	750 kVA	1,000 kVA	1,500 kVA	2,000 kVA	2,500 kVA	3,000 kVA	3,500 kVA	5,000 kVA	6,000 kVA
2,400	CL-14	50	260	200	250	400	500	600	---	---	---	---	---
2,400	RBA400	37.5	155	200	250	400	---	---	---	---	---	---	---
2,400	RBA800	37.5	155	---	---	---	540	720	---	---	---	---	---
2,400	HCL	50	260	200	250	400	---	---	---	---	---	---	---
2,400	EJO-1	50	260	200	250	400	---	---	---	---	---	---	---
2,400	SM-5S	37.5	155	200	250	400	---	---	---	---	---	---	---
4,160	CL-14	50	450	100	125	200	300	500	500	---	---	---	---
4,160	RBA400	37.5	270	100	150	200	300	400	---	---	---	---	---
4,160	RBA800	37.5	270	---	---	---	---	---	540	540	---	---	---
4,160	HCL	50	450	100	125	200	300	---	---	---	---	---	---
4,160	EJO-1	50	450	100	125	200	300	---	---	---	---	---	---
4,160	SM-5S	37.5	270	100	150	200	300	400	---	---	---	---	---
4,800	CL-14	50	520	80	125	200	250	400	450	---	---	---	---
4,800	RBA400	37.5	310	100	125	200	250	400	400	---	---	---	---
4,800	RBA800	37.5	310	---	---	---	---	---	---	540	---	---	---
4,800	HCL	50	520	80	125	200	250	400	---	---	---	---	---
4,800	EJO-1	50	520	80	125	200	250	400	---	---	---	---	---
4,800	SM-5S	37.5	310	100	125	200	250	400	400	---	---	---	---
7,200	CL-14	50	620	65	80	125	200	250	300	---	---	---	---
7,200	RBA400	25	311	65	80	125	200	250	300	400	---	---	---
7,200	RBA800	25	311	---	---	---	---	---	---	---	450	---	---
7,200	HCL	50	620	65	80	125	200	250	300	---	---	---	---
7,200	EJO-1	50	620	65	80	125	200	---	---	---	---	---	---
7,200	SM-5S	25	311	65	80	125	200	250	300	400	---	---	---
12,470	CL-14	50	1,079	40	50	65	100	125	200	200	250	---	---
12,470	RBA400	25	540	40	50	80	100	150	200	200	250	400	---
12,470	RBA800	25	540	---	---	---	---	---	---	---	---	---	450
12,470	HCL	50	50	40	50	65	100	125	200	200	250	---	---
12,470	EJO-1	50	50	---	50	65	100	125	200	---	---	---	---
12,470	SM-5S	25	25	40	50	80	100	150	200	200	250	400	---
13,200	CL-14	50	1,143	30	50	65	100	125	150	200	250	300	---
13,200	RBA400	251	571	30	50	65	100	125	150	200	250	300	400
13,200	RBA800	251	571	---	---	---	---	---	---	---	---	---	---
13,200	HCL	50	1,143	30	50	65	100	125	150	200	250	300	---
13,200	EJO-1	50	1,143	---	50	65	100	125	150	---	---	---	---
13,200	SM-5S	25	571	30	50	65	100	125	150	200	250	300	400
13,800	CL-14	50	1,195	30	50	65	100	125	150	200	250	300	---
13,800	RBA400	25	597	30	50	65	100	125	150	200	250	300	400
13,800	RBA800	25	597	---	---	---	---	---	---	---	---	---	---
13,800	HCL	50	1,195	30	50	65	100	125	150	200	250	300	---
13,800	EJO-1	50	1,195	---	50	65	100	125	150	---	---	---	---
13,800	SM-5S	25	597	30	50	65	100	125	150	200	250	300	400

# Fuse monitoring system

SIEBREAK switchgear can be specified with fuse indication, blown fuse indication, and blown fuse trip options

## Fuse monitoring system

Fuse monitoring system is new for our SIEBREAK fused, load-interrupter switchgear. The fuse monitoring system provides users various options including blown fuse indication and single-phase protection. The blown fuse indication feature provides a safe and fast way to detect a blown fuse condition without having to open the main door, and single-phase protection uses the blown indication with auxiliary contacts and the shunt trip switch mechanism to open the switch when a blown fuse condition occurs on either of the fuses in the SIEBREAK fused, load-interrupter switchgear.



Blown fuse window with indication flag

Fuse monitoring system is available in the following switch mechanisms <sup>1</sup> :				
Options	Availability by switch mechanism			
	Manual-operated switch	Shunt trip manual-operated switch	Shunt close manual-operated switch	Shunt trip motor-operated switch
Blown fuse window <sup>2</sup>	Yes	Yes	Yes	Yes
Blown fuse window with indication flags <sup>3</sup>	Yes	Yes	Yes	Yes
Blown fuse indication - remote terminals <sup>4</sup>	Yes	Yes	Yes	Yes
Blown fuse indication - LED display <sup>5</sup>	Yes	Yes	Yes	Yes
Blown fuse trip <sup>6</sup>	No	Yes	No	Yes

Fuse monitoring system and shunt trip and close options are available in the following switch types:			
Fuse monitoring options	Single	Duplex	Selector
Blown fuse window	Yes	Yes	Yes
Blown fuse window with indication flags	Yes	Yes	Yes
Blown fuse indication - remote terminals	Yes	Yes	Yes
Blown fuse indicatin - LED display	Yes	Yes	Yes
Blown fuse trip	Yes	Yes	No
Fuse monitoring options	Single	Duplex	Selector
Shunt trip manual-operated switch	Yes	Yes	No
Shunt close manual-operated switch	Yes	Yes	No
Shunt trip motor-operated switch	Yes	Yes	No

### Footnotes:

1. Fuse monitoring system is available for current-limiting fuses and not available for expulsion fuses.
2. Viewing window to visually fuses for blown condition without opening the main compartment door.
3. Indication flags with viewing window (see photo above).
4. Indication flags wired out to customer terminal block for remote monitoring.
5. LED lights to display a blow or missing fuse condition.
6. Trips switch open on a blown or missing fuse condition.
7. Control power required for LED display, blown fuse trip, and all shunt options.
8. Shunt switch options available for 120 Vac or 125 Vdc. Unless specified, control power to be provided by others.



Blown fuse window with indication flags and motor-operated switch, shown with main door open

# Metering

SIEBREAK switchgear can be equipped with the required auxiliary devices for the applications including current transformers, voltage transformers, and low-voltage metering devices

Current transformers					
Ratio	50 Hz metering accuracy at burden				Relay class
	B0.1	B0.5	B1.0	B2.0	
Type MD toroidal standard accuracy					
100:5	2.4	----	----	----	C 15
150:5	0.6	2.4	----	----	C 20
200:5	0.6	1.2	----	----	C 25
250:5	0.6	1.2	----	----	C 35
300:5	0.6	1.2	2.4	----	C 40
400:5	0.3	0.6	2.4	----	C 60
500:5	0.3	0.3	1.2	----	C 75
600:5	0.3	0.3	0.6	----	C 100
800:5	0.3	0.3	0.6	0.6	C 130
1,000:5	0.3	0.3	0.3	0.3	C 170
1,200:5	0.3	0.3	0.3	0.3	C 200

## Current transformers

SIEBREAK switchgear is available with current transformers as an option for current and power metering. The current transformers are located between the load side of the switch and the line side of the fuses.

Current transformers located between switch and fuses of a duplex switch



## Voltage transformers

SIEBREAK switchgear is available with voltage transformers as an option for voltage and power metering. The standard location of the voltage transformers is in the front above the switch.

Voltage transformers located above the switch

Voltage transformers					
Voltage class kV	Ratio	Accuracy class			VA thermal rating
		X, Y	Z	XX	
5	2,400/120	0.3	1.2	----	500
5	4,200/120	0.3	1.2	----	500
5	4,800/120	0.3	1.2	----	500
15	7,200/120	0.3	0.3	1.2	1,000
15	8,400/120	0.3	0.3	1.2	1,000
15	12,000/120	0.3	0.3	1.2	1,000
15	14,400/120	0.3	0.3	1.2	1,000



Control power transformer						
Primary voltage V	Secondary voltage V	Number of phases	Impulse level kV BIL	Thermal ratings <sup>1</sup>		
				5 kVA	10 kVA	15 kVA
2,400	120/240	1	60	✓	✓	✓
4,160	120/240	1	60	✓	✓	✓
4,800	120/240	1	60	✓	✓	✓
7,200	120/240	1	95	✓	✓	✓
8,400	120/240	1	95	✓	✓	✓
12,000	120/240	1	95	✓	✓	✓
12,470	120/240	1	95	✓	✓	✓
13,200	120/240	1	95	✓	✓	✓
13,800	120/240	1	95	✓	✓	✓
14,400	120/240	1	95	✓	✓	✓

### Control power transformer

SIEBREAK switchgear is available with an optional control power transformer up to 15 kVA. When specified, this transformer is typically required to supply power to space-heater circuits, battery systems, lights, and other loads when 120/240 V source is needed.

**Footnote:**

<sup>1</sup> Thermal rating in 86 °F (30 °C) ambient. 86% of rating shown in 131 °F (55 °C) ambient.



### Surge protection

SIEBREAK switchgear is available with optional surge arresters for distribution-, immediate-, or station-class type arresters. Surge arresters comply to IEEE standard C62.11 for Metal-Oxide Surge Arrester for AC Power Circuits (> 1 kV).

The standard location for the surge arresters is in the front above the switch, except when voltage transformers are supplied. In this case, surge arresters are repositioned to the rear.

Station-class surge arresters shown located in the rear when voltage transformers are installed

**Power metering**

SIEBREAK switchgear is available with the optional Siemens SENTRON PAC compact and powerful power-monitoring devices. These devices are compact so they can be mounted on the front door of the SIEBREAK enclosure. Whether in industrial applications or commercial buildings, the SENTRON PAC power-monitoring devices can be employed wherever electric power is distributed and processed.



Functional overview (part 1 of 2)				
Instrument variants	Sentron	PAC3100	PAC3200	PAC4200
<b>Basic measurement variables</b>				
Voltage, current		✓	✓	✓
Neutral conductor current		✓	----	✓
Apparent power, active power, reactive power, power factor		✓	✓	✓
Power factor of the fundamental wave		----	----	✓
Frequency	Of the reference phase	✓	✓	✓
Minimum/maximum values	Slave pointer function I with date and time	✓   ----	✓   ----	✓   ✓
<b>Power measurement</b>				
Apparent energy		----	✓	✓
Active energy, reactive energy	Input   Output   Balance	✓   ✓   ✓	✓   ✓   ----	✓   ✓   ----
Number of tariffs	Apparent, active, and reactive energy	1	2	2
Daily energy values for 365 days	Apparent, active, and reactive energy	----	----	✓
Consumption recording of a sub-process or manufacturing process	Apparent, active, and reactive energy	----	----	✓
Power averages of the last measurement period	Active and reactive power average with minimum/maximum value	✓	✓	✓
Load-profile record		----	----	✓ maximum 3,840 entries <sup>1</sup>
E-counter for S <sub>0</sub> signal at a digital input	Electrical energy   any energy	----   ----	✓   ----	✓   ✓
Accuracy class for active energy	According to IEC 62053-21/62053-22	Class 1	Class 0.5 s	Class 0.2 s
Accuracy class for reactive energy	According to IEC 62053-23	Class 3	Class 2	Class 2
<b>Monitoring of state of the plant and quality of the network</b>				
Configurable displays	For presenting up to 4 measured quantities	----	----	4
Operating hours counter	Operating hours of loads	----	✓	✓
Sliding means values	U, I, S, P, Q, LF	----	----	✓
THD voltage, current		----	THD-R	THD
Distortion current strength		----	----	✓
Phase angle, phase-displacement angle		----	----	✓
Unbalance	Voltage   current	----	$U_{nba}   I_{nba}^2$	$U_{nb}   I_{nb}^3$
Harmonics in voltage, current		----	----	3 to 31 <sup>st</sup>
Limit-value monitoring	Maximum number of limit values	----	6	12
Boolean logic	For limit values   inputs	----   ----	✓   ----	✓   ✓
Event memory for operation, control, and system-related events	Including time stamp	----	----	✓ (> 4,000 events)
Battery backup for minimum/maximum values		----	----	✓

**Footnotes:**

1. This corresponds, for example, to a duration of 40 days with a measurement period of 15 minutes.
2.  $U_{nba} - I_{nba}$  - Unbalance with regard to amplitude.
3.  $U_{nb} - I_{nb}$  - Unbalance with regard to amplitude and phase.
4. In conjunction with SENTRON PAC RS485 expansion module.

√ Available

--- Unavailable



Functional overview (part 2 of 2)				
Instrument variants	Sentron	PAC3100	PAC3200	PAC4200
<b>System integration and communication</b>				
Ethernet (integrated)				
■ Protocol	Modbus TCP	---	10 Mbits/s	10/100 Mbits/s
■ Gateway	Ethernet ↔ RS485 (Modbus)	---	√	√
Profibus DP (V1)		---	Expansion module optional	
RS485		Integrated	Expansion module optional	
■ Protocol	Modbus RTU	√	√	√
4 DI/2 DO expansion module	Expansion to maximum 10 DI/6 DO	---	---	√ (maximum 2 modules)
Number of expansion modules	Maximum	---	1	2
Integrated digital inputs (DI)	Number I multifunctional	2   ---	1   √	2   √
Integrated digital outputs (DO)	Number I multifunctional	2   √	1   √	2   √
<b>Installation plan</b>				
Dimensions (length x width x depth)	In inches (mm)	3.78 x 3.78 x 2.20 (96 x 96 x 56)	3.78 x 3.78 x 2.20 (96 x 96 x 56)	3.78 x 3.78 x 3.23 (96 x 96 x 82)
Mounting depth	PAC   PAC with expansion module in inches (mm)	2.01 (51)   ---	2.01 (51)   2.87 (73)	3.03 (77)   3.90 (99)
Panel cut out (length x width)	In inches (mm)	3.62 x 3.62 (92 x 92)	3.62 x 3.62 (92 x 92)	3.62 x 3.62 (92 x 92)
<b>Standards and approvals</b>				
UL / cUL		√	√	√
IEC 61557-12		√	---	√



**Legal Manufacturer**

Siemens Industry, Inc.  
7000 Siemens Road  
Wendell, North Carolina 27591  
United States of America  
Telephone: +1 (800) 347-6659  
[www.usa.siemens.com/siebreak](http://www.usa.siemens.com/siebreak)  
Order No. EMMS-T40049-06-4AUS

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